RURAL INEQUALITY AND NUTRITION: AN ANALYSIS OF THREE RURAL COMMUNITIES IN THE DOMINICAN REPUBLIC

An Undergraduate Research Scholars Thesis

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ABSTRACT

Rural Inequality and Nutrition: an Analysis of Three Rural Communities in the Dominican Republic (May 2015)

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The Sunflower Project, a small nutrition-education project in a rural area in the Dominican Republic, grew haphazardly from its establishment in summer 2013, relying on non-academic resources and guides to shape project goals and activities. Though not unusual for development initiatives of its size throughout the world, the lack of concrete, applicable information to properly direct and support the Sunflower Project limited the credibility of the work being done and discredited the individuals who managed it. The purpose of this project is to properly inform the Sunflower Project and reinforce or modify its existing goals. I interviewed thirty local women about food-ways and wealth indicators, including agricultural resources and occupations. Scatter-plots of estimated income (with and without agricultural wealth) versus reported frequency of fruit and vegetable consumption indicated no relationship, nor did wealth inequality appear to affect the overall dietary breadth of households sampled. Income did have a significant association with overall dietary breadth. Distance to market has a negative impact on fruit and vegetable consumption, but analysis was complicated by mobile grocery routes. Living off the main grocery route reduces average weekly fruit and vegetable consumption by two servings. Analysis of foods consumed by each household, as reported in interviews, indicated preference towards fruits over vegetables and proteins over dairy. Given these observations, the Sunflower

Project should conduct educational activities and recommend home projects with low resource requirements and high nutritional impact potential. The Sunflower Project should also explore heat resistant varieties of broccoli, which interview participants found desirable. Effort towards increasing vegetable consumption in the communities will require solutions to the reported obstacles to consumption, most notably access, cost, and storage of fruits and vegetables. Overall, the project should maintain focus on health, nutrition, and the environment, as described in the project's current mission statement.

DEDICATION

First and foremost, this work is dedicated to my friends and family in the *campo*: *Gracias por cuidarme y contestar todas mis preguntas. Los quiero a todos y siempre estarán en mi corazón.*

I would also like to dedicate this work to the minds behind the Sunflower Project. Alicen, Taylor, Kinsey, I could not imagine going on this adventure with anyone else. You have forever impacted my life and my career, and I hope you never stop. I hope each of you read this and marvel at what we've done.

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CHAPTER I

INTRODUCTION

There is a growing portion of the global population that is driven enough by media discussion of human tragedy and individual motives to go out into the world and attempt to correct problems associated with poverty. Members of this aid-focused segment of the population gravitate toward the work carried out by government entities like the Peace Corps or that of Non-Governmental Organizations (NGOs), of which there are numerous throughout the world. NGOs vary in size from small organizations that work in everything from community education programs to microfinance, to the massive international organizations like the Red Cross and Save the Children that focus on multiple problems and move massive amounts of resources.

The effectiveness of aid organizations, governmental and non-governmental, is always up for discussion within the organizations themselves and the populations they serve, largely because there is no existing international system by which to judge or control non-government entities, leaving governments to construct their own systems of regulation and evaluation (Abbey 2007). In countries like Bangladesh, home to one of the most developed NGO sectors in the world, NGOs are required to submit to registration and regular evaluation, thus maintaining the discussion between the government, the population, and aid organizations, and moving Bangladesh towards poverty alleviation and effective relief (Abbey 2007). In most other countries around the world, that discussions is fragmented and sometimes non-existent.

The Dominican Republic is an example of a country where NGOs are not visibly regulated through a process of registration or evaluation. According to the World Bank, in 2012, approximately 40.9 % of the total population in the Dominican Republic was living in poverty (World Bank 2015). That percentage has generally declined over the past decade as the Dominican Government and numerous NGOs have made efforts to enhance development throughout the country.

The ability of the Dominican Government to make effective, large scale improvements in development is hindered by numerous socio-political factors, including a bloated bureaucracy and corruption. In the U.S. Department of State's Fiscal Transparency Report for 2014, the Dominican Republic was one of three Latin American countries, the others being Haiti and Nicaragua, who did not meet minimum standards for fiscal transparency. This was largely due to the Dominican Republic's allocation of 9% of their budget to the Office of the President and minimal explanation of the purpose for that money (Higginbottom 2014). This lack of transparency in fiscal spending is a product of poor management and a possible indicator of corruption in the Dominican Government. Corruption creates an impediment to legislation and enforcement, therefore slowing the process of change.

Another key issue in the Dominican Republic is immigration and citizenship. The never ending flow of Haitian immigrants crossing the Dominican-Haitian border has put immeasurable stress on health and public services throughout the Dominican Republic (El Nuevo Diario 2014). For many immigrants, the public health system poses too much risk of deportation, leaving a

significant segment of the population in need of proper health services and plenty of opportunities for NGOs focused on supporting public health (Simmons 2010).

At the moment, there is a new citizenship law in the process of being implemented. The legislation creates a fast-track for illegal residents in the Dominican Republic who can prove their place of birth to obtain citizenship. This allows Haitian-Dominicans, whose parents and grandparents immigrated from Haiti and chose to stay illegally in the Dominican Republic, as well as other foreign residents, the opportunity to regularize their citizenship status (RDMIP 2014). The effectiveness of this new legislation is threatened by the existing system of enforcement in the Dominican Republic, but it is a first step toward reducing stress on the Dominican public health system by accurately portraying the number of people it serves.

Even with the enhanced government supervision of non-citizens, the environment is ripe for the growth of small NGOs capable of providing aid without ever registering themselves or declaring their intentions. Many of the larger NGOs in the Dominican Republic are simply tools to improve the appearance of political candidates, giving the candidate a cause and the organization a spokesperson (Abbey 2007). The Peace Corps and Save the Children have a presence in the Dominican Republic, as does the World Bank, with 61 registered projects, most of which focus on sanitation and water management (World Bank 2015). The degree to which these international organizations' impact is felt is debatable.

With an environment that demands no restrictions or regulations, small NGOs, few of which could be found on any registry labelling them as such, are allowed the opportunity to flourish

without interference from the government. The Dominican Republic's high levels of poverty, relative safety, and slow moving government give these small NGOs plenty of work, allowing for their number to continue growing. Every organization is left with the responsibility of regulating and evaluating itself.

Getting Started

In the summer of 2013, I became of member of a small NGO focused on health, nutrition, and environmental education for school-aged children. As the project took form as a curriculum for both the classroom and informal summer-camps in 2014, I realized that my friends and I were not fulfilling our responsibility to evaluate ourselves as an organization for the benefit of those we have chosen to serve. The project itself is geared toward making a positive impact, and participants are not exposed to any obvious harm, but the ability for our organization to measure its impact based on previous information was lacking. In short, we had not done the real research we needed to do in order to evaluate our project in the future. Our project was in need of a comprehensive picture of the social and nutritional environment in which we had chosen to work. The growth of the project and our motivations for starting it will be discussed more in depth in the next chapter.

The most obvious questions pertained to the existing dietary habits of households in the communities, their existing opinions on food, and their willingness to change opinions and, hopefully, habits. Literature regarding food consumption in the Dominican Republic is relatively limited, and focuses more on urban areas than the rural environment in question (Rosing 2009). Observations of the project's program director after a year of living in one of the communities

proved to be the best background information we had, and some insights showed small, but notable differences in food perception between the *campo* (country/rural area) and a small nearby town.

Other underlying questions for this background research concern the depth of resources held by households in the communities. How great is the poverty in this area and what is the likely effect of that poverty on household nutrition? A house with a single sow or a few chickens is significantly wealthier than a house without any animals, even if they both subsist on the same monetary income. The household with the animals is more likely to be able to feed itself in the event of a loss of income. Knowing the depth of poverty in the area and the theoretical "wiggle room" a typical household has to purchase additional vegetables or buy seeds to start a garden has a great impact on the types of suggested "take-home" activities from our program. This thesis will focus on describing the relationship that wealth and income have with diet and nutrition in the area affected by the project.

Poverty & Nutrition

The poverty line, as defined by the World Bank, is $1.25 a day (PPP) (World Bank 2015). Our project makes the assumption that households in the communities affected by our program are living below this poverty line. Qualitative observations of life in the *campo* contribute to this assumption, and this thesis seeks to confirm or refute these observations using income as the primary measure of poverty.

In addition to poverty, the project is also concerned with inequality. Our goal is for all project participants to be able to reproduce activities and lessons regardless of resources. This thesis will use two closely related measures of inequality used by the World Bank, the GINI coefficient and the Lorenz Curve. An explanation of these measures will be given in the Results chapter.

The effect of poverty and inequality on nutrition has been well documented throughout the world. Stunting is a well-known symptom of long-term childhood malnutrition. A study in Ecuador found that economic inequality at the provincial level had a significant negative association with stunted growth (Larreaa and Kawachi 2004). The authors suggest that much of the inequality found in this study was also closely associated with social prejudices and cultural fragmentation that are an integral to Ecuadorian culture (Larreaa and Kawachi 2004). The Dominican Republic has a similar history of cultural fragmentation and social prejudices against Haitians and Dominican-Haitians, who are marginalized in urban areas because of these prejudices (Simmons 2010). Socially and racially, the communities affected by our project are almost uniformly Dominican. Racial biases, therefore, should not play a role in income or wealth inequality in these communities. This greatly simplifies the relationship between inequality and nutrition in this area, removing what is likely a significant confounding variable.

Another important factor affecting nutrition is a person's ability to acquire food. In the United States, a food desert is defined as "an urban or rural area with significantly limited access to retail sources of healthy and affordable food" due to distance or socio-economic indicators (Russell 2011) . The Dominican Republic is steadily becoming more urbanized, a change that is

reflected in the growing number of super markets and large chain stores appearing throughout the country (World Bank 2015).

However, supermarkets and chain stores are not the only source of food available. The *colmado*, a general store, serves to provide most communities with the essentials; rice, beans, a few starchy vegetables (*vivere*), paper products, and now, convenience foods in urban and rural communities (See Appendix C). The *colmado* also serves as a source of credit for urban and rural families, making it an anchor for social and economic activity (Rosing 2009). The area discussed in this thesis supports a few *colmados*, which reduces the impact of the distance to the nearest town on nutrition. The *colmados* in this area do not carry a wide selection of fruits and vegetables. However, mobile groceries travel through the area regularly, bringing fruits and vegetables to certain communities, but not others (See Appendix C). A major goal of our project is to improve nutrition, especially fruit and vegetable consumption, through gardening. It is important to our project to determine the effect of distance to market and mobile groceries on fruit and vegetable consumption so that we know which communities are in the most need.

Applied Anthropology

The manner in which our initiative has chosen to accomplish its goals will be discussed in detail in the next chapter. Fortunately, the work our tiny organization has done and the ways we've ended up doing it have been in-line with recommended methods for starting a development project. Applied anthropology literature has shown that small, more culturally uniform target populations with stable existing social networks have a higher probability of experiencing positive effects from well-designed development or aid initiatives (Hackenberg 1999). As the

community benefits from the work of our small development initiative, we benefit from an existing social structure of families and friends who accept our work and are willing to participate. Word of mouth, among children participating in the summer camps and their parents, played a key role in our ability to reach more of our target population. Another key component in applied anthropology projects is the presence of a reliable community spokesperson or liaison who facilitates the efforts of the project (Hackenberg 1999). As discussed in the next chapter, the facilitator of our project in each location made a drastic difference in the immediate effectiveness of our project, as measured by the number of students participating in each location each week.

As an anthropology student with some experience doing structured interviews, I chose to interview household representatives from thirty homes in the communities that hosted the summer camp version of our project. The methods and results will be discussed in detail in subsequent chapters. The lack of existing literature that could be used to inform a future evaluation of our project led me to collect the data necessary to fill that whole in the literature with what most anthropologists would classify as a needs assessment. A needs assessment is "an appraisal of what is required to alleviate one or more specific problems" in an given area (Gwynne 2004). In the case of our organization, the existing problem is a prevalence of poor nutrition, as perceived by our organization, a group of college-educated women who have always been taught that poverty and malnutrition are strongly correlated. Another problem, implied by our desire to make change, is the communities' willingness and ability to change. Needs assessments are used in a variety of settings and they rely on a variety of methods including surveys and key informant interviews. I chose to utilize key informant interviews and observations to assess the communities.

Analysis of the data will allow me to make recommendations to the program director regarding the focus of lessons and activities for summer camps, thus adding elements of a program evaluation to the purpose of this investigation. Overall, this investigation serves as an example of a needs assessment and a program evaluation for NGOs of similar size. Ideally, the same survey used for this investigation will be used again in the future for the project to evaluate its progress. Some elements may be added or taken away, but the greater the similarity in the survey, the stronger the comparison and the more accurate the evaluation. While the tools used to evaluate each NGO are unique to that organization's purpose or mission, it must be possible to reuse them in order to discern change. The survey is measurement and observations, the organization's efforts are the experiment.

The following chapters and appendices describe my experiences and observations with respect to our project, the Sunflower Project, since its beginnings in the summer of 2014. Chapter two describes the evolution of the Sunflower Project from a curriculum closely patterned after one used in the United States, to a fusion of that curriculum with observations, culturally appropriate sources, and experiences. This chapter will also discuss the experience of implementing weekly summer camps in the *campo*, the various challenges we encountered and the help we received in overcoming them. Finally, this chapter describes the events and discussions that led to the modification of my intended summer project, a pure evaluation of the program, into the needs assessment-program evaluation hybrid that it has become. Chapter three will provide a more detailed background description of the *campo* concentrating especially on the communities where the summer camps take place and where data was collected. This chapter will also give a

description of the survey used to collect data and the contributing factors to each element in the survey, as well as how results were recorded and analyzed. Chapter four will discuss the relationship between wealth, income, proximity to market and diet found by the survey using quantitative measures and qualitative observations. Chapter five will draw conclusions and make recommendations based on the results discussed in Chapter four. The appendices to this thesis discuss in greater detail some elements found in Chapters four and five, and provide a photographic catalog of my observations throughout my time in the Dominican Republic.

CHAPTER II

THE SUNFLOWER PROJECT

This chapter is a review of the influences and experiences that evolved into the Sunflower Project, a small education initiative that focuses on teaching school-aged children about health, nutrition, and the environment. There are two aspects to the program; a curriculum taught in a traditional school setting over the course of a school year (the classroom version) and a weekly summer camp hosted at local schools over ten weeks (the summer camp version) . The classroom version of the Sunflower Project is taught at a small school in the town of Cabrera, about thirty minutes from the *campo* (rural area) where the summer camps are hosted. Faro de Cabrera, the school that hosts the curriculum, serves a small group of children whose parents have elected to have them educated outside the public and private Dominican education systems. Instruction is provided in English and Spanish and each student is allowed to proceed at his or her own pace. This structure leaves plenty of room for project-based learning, making it an ideal place for the Sunflower Project, and the program director, to take root and develop. At Faro de Cabrera, the Sunflower Project serves as a supplement to science lessons.

While an assessment and evaluation of the environment at Faro de Cabrera might have been an interesting project and yielded important insights, I opted to focus on the summer camp version of the Sunflower Project instead. The most immediate reason for this decision is the timing of my research. I was not available during the school year to conduct research in the Dominican Republic and observe activities at Faro de Cabrera. I also chose to focus on the summer camp version of the program because it has more unknowns. The summer camps serve a larger

population than Faro de Cabrera, leaving a greater number of opinions and situations to be explored. Conversely, the families served by Faro de Cabrera have a greater variation in socioeconomic status and cultural background because many of them are ex-patriots or Dominicans who have spent time outside the Dominican Republic. A needs assessment or program evaluation for the classroom version of the Sunflower Project would have yielded interesting, but convoluted, results that would not necessarily have benefited the structure of the program itself. Collecting information in the *campo* is more beneficial to the program because there is more to be collected and the program director's work at Faro de Cabrera prevents her from having the time to do so.

The sections that follow will give a more detailed description of the Sunflower Project and how it came to be. This chapter is also filled with cultural insights that are relevant to process of doing research in the *campo*.

Evolution and Intention

The Sunflower Project began as the ill-informed dream of four college students with broad connections looking to make a difference in the world. My three optimistic friends and I arrived in the community of La Esquina del Callejón (La Esquina, for the rest of this thesis) in May of 2013 with the strong belief that we could establish a community development initiative in just seventy-five days. The initiative in question was to be based on the "Learn, Grow, Eat, Go" curriculum designed by the Texas Junior Master Gardeners. We were fully aware that we would need to make significant modifications to the existing curriculum due to the sheer geographical and cultural differences between Texans and Dominicans, but we felt prepared enough to do it.

We had even taken the unrealistically rapid timeline of events we'd planned out a few months before and estimated that every step would take a week instead of a few days, thus stretching our timeline to compensate for the inescapable phenomenon known as "island time" and removing a few goals from the list. I had spent a week visiting the community in 2012, seen the local school where we planned to work and met the director of the school. I had also been studying Spanish for six years, more than any of my friends by far. Two of our group members had done the research on common nutritional issues and health indicators in the Dominican Republic. The fourth group member, a freshly graduated elementary school teacher, had spent the previous nine months going over the curriculum, making modifications, coming up with new ideas, and desperately studying to learn basic survival Spanish. We were all focused on the goal, and optimistic about the outcomes.

The motivations for starting this adventure stemmed from a handful of sources. The first was the experiences of one of our group members, an Agricultural Development major, implementing a similar curriculum at a community center in Guatemala. She had existing connections within the Texas Junior Master Gardener program, which gave us access to the curriculum we planned to work with. The second was a professor and friend who had spent extensive time in the Dominican Republic and in La Esquina. She was my original connection to the community, and provided us with the encouragement to expand an idea into a plan. The third was a brief, unpublished, exploratory study conducted by a student in the study abroad program that visits the area each summer. As part of the program, students conduct short research projects focused on comparing an aspect of health and nutrition in Jarabacoa, a small town, and La Esquina, a rural village. This particular project was suggested to the student by our professor, who has been

leading this study abroad program for over a decade. The student's findings indicated that, while both locations would benefit from a curriculum similar to the "Learn, Grow, Eat, Go" curriculum, the village of La Esquina was in greater need (Spitz 2011). The remaining sources of motivation for starting our adventure stemmed from a collective faith in ourselves and the people supporting us. In retrospect, we all admit that we began our project with almost no background research, and our project has continued to function without it. As this is the one fact of our adventure that irritates me most, I have elected to gather the necessary background information so that we may someday discern the effects of our work in the area.

Our intent, in the summer of 2013, was to establish the curriculum in La Capilla, at the school that serves La Esquina and four other communities, including El Callejón and El Pujador. We have not yet achieved that goal. At the end of our first Summer, the fourth group member stepped into the role of program director, determined to implement our program. She spent the next ten months living in La Esquina, learning Spanish while volunteering as an English teacher at La Capilla, and essentially doing the qualitative background research that needed to be done in order for our project to work. She also found Faro de Cabrera. The program director spent one day a week at Faro de Cabrera for a semester, test-driving activities from the "Learn, Grow, Eat, Go" curriculum and other sources. The result was her project proposal for the Sunflower Project and a full time teaching position at Faro de Cabrera.

Explanation

The Sunflower Project is an educational curriculum aimed at teaching school-aged children about health, nutrition, and the environment. The design for the project relied on numerous resources.

Learn Grow Eat Go

The initial source for the program was the "Learn, Grow, Eat, Go" curriculum from the Texas Junior Master Gardener Program. The curriculum itself was created for students from 1st through 8th grade and was meant to supplement an already existing science curriculum. The curriculum itself focuses on environmental issues and encourages cooperation through group activities.

We underestimated the amount of adaptation this curriculum would require in order to be applied effectively in La Capilla. Many activities were based on American cultural concepts, like Bingo, for which Dominicans do not have an equivalent. Consequently, certain activities were discarded entirely because they hinged on a principle that was not present in the target population. Other activities remained largely intact, and only the content was modified to accommodate for the availability of foods in the Dominican Republic, more specifically in the province of Maria Trinidad Sanchez. Pictures of berries were substituted with pictures of mangos, round peas replaced with *guandule*, the Dominican pea, which is flatter in shape and exhibits a range of colors, and foods like *yuca* (a common tuber) and *castaña* (breadfruit) were added to the activities.

El Pilon – The National Nutrition Initiative

Because of the limited application of the Junior Master Gardener Curriculum, the program director turned to government resources for more information. She found the most recent dietary model released by the Dominican government in 2013. In the United States, the food pyramid model has recently been replaced by the My Plate model as a guide for teaching proper nutrition (CNPP 2011). The Dominican Government chose to utilize the *pilon de alimentacion y nutricion (PAN)* as the symbol of their dietary recommendations (Republica Dominicana Ministerio de Salud Publico 2013). *El Pilon,* the mortar and pestle, is an essential tool in every Dominican kitchen where it is traditionally used to grind spices for the midday meal of meat, beans, and rice. The PAN organizes the dietary recommendations made by the Dominican public health ministry, providing a visual representation of food groups and how they should be prioritized (Figure 2.1). The mortar of the PAN is divided into the major food groups of the Dominican diet, including proteins, cereals, fruits and vegetables, legumes and beans, and *vivere*. *Vivere* are starchy vegetables and fruits like *yuca, batata, yautia,* potatos and plantains (Despacho de la Primera Dama 2009). They are a very important part of the Dominican diet and they represent a major source of carbohydrates and a few key nutrients. Remaining dietary staples like sugar, salt, and oil are on the pestle, the smallest portion of the PAN, to indicate that they should be used sparingly. The PAN is also depicted on a cutting board, where an image of an infant breastfeeding and then transitioning to solid foods emphasizes the importance of the good nutrition from infancy.

The accompanying nutrition guide is very detailed in its description of recommended portion sizes and activities and its breakdown of the nutritional importance of each recommendation. The

guide was made with the traditional customs of Dominican families in mind. For example, recommended exercises include dancing, playing baseball, and swimming at the beach, all of which are presented as family activities. These recommendations emphasize the existing habits of many family groups and communities in Dominican culture. The guide focuses largely on encouraging people to change the portions of food they consume. It also emphasizes the use of enriched cereal products, which have become cheaper in the Dominican Republic because of the Central American-Dominican Republic Free Trade Agreement (DR-CAFTA) that was enacted in 2006, as described in the guide.

Figure 2.1. El Pilón de Alimentación y Nutrición (PAN) is the Dominican version of the My Plate program in the U.S.

The program director chose to utilize the PAN in her lessons for the Sunflower Project as a way to further the goals outlined in the guide published by the government, to keep her Faro de Cabrera students' education congruent with the lessons received by children of the same age in public schools, and as a way to organize lessons. The PAN and its accompanying guide were extremely educational for us, introducing us to an official definition of Dominican diet and how foods are categorized, and giving the program a solid background on the nutritional problems faced across the country.

Qualitative Observations

The third and final resource used in the design of the Sunflower Project was the experience of the program director as she adapted to living in La Esquina and teaching in La Capilla and at Faro de Cabrera. After the rest of the original group left in August 2013, the program director was left to learn about the local ways of acquiring and preparing foods from her friends and neighbors. Most vegetables arrive in the community in the back of a pick-up truck that acts as a mobile-market, where women can purchase enough fresh produce for a few meals at a time. Many households struggle to store fresh vegetables and choose to rely on the trucks that come through the community every couple days. The trucks announce themselves through their sound systems, the driver of the truck rattling off products and prices like an auctioneer. Clean water, coffee, and bleach are brought to the community in a similar manner.

Living by herself, the program director gained a valuable perspective for designing the program. Living on her own has given her the insight into running a household that she would not have

gained from living with her host-family. Her work at Faro de Cabrera also offered important observations of differences between the *campo* (rural area) and the town of Cabrera, such as variations in food preferences and ways of cooking. Her observations and experiences were important for altering lessons meant for Faro de Cabrera students to fit the students in the *campo.*

Outside influences

Another contributing factor to the design of the Sunflower Project is the uniqueness of this particular area. La Esquina, El Callejón, and the surrounding villages experience little of the macro-political or socio-economic shifts that rock larger population centers. The surest signs of government influence are recent changes to the school system and the manipulation of electricity and water supply. The most unique thing about these communities is their surprisingly strong ties and frequent interactions with outsiders.

The Study Abroad Program

Every year for the last twenty years or so, La Esquina has played host to a study abroad program for university students from the United States for approximately three weeks in the summer. These students spend seven weeks in the Dominican Republic, three in Jarabacoa, a large town (pueblo), three in La Esquina and El Callejón, and one week near Santo Domingo, the capital. Each student is tasked with completing a research project that compares the *campo* with the pueblo. Most students focus on health and nutrition, or some aspect of the environment that affects public health.

Students live with families during their stay in each location, and each family benefits from a stipend for room and board. The study abroad program ranges in class size from 5 to 30 students, and a group of 10-15 is normal. Families that host students must meet certain requirements. For instance, the household must have a separate room for the student and a working bathroom or outhouse. Some families depend heavily on the stipend they receive from the program. Almost all of the money goes to feeding the student. However, an entire household benefits from special items, like fruits and vegetables, bought specifically for the student. It is a program requirement that students' diets consist of a certain amount of vegetables and that they receive three complete meals per day. Students and host families are encouraged to communicate about food, and many students have introduced new foods or new ways of cooking foods to their host families. Host-mothers gain great satisfaction from accommodating their students' needs and showing their students' how food is prepared, a fact to which I can personally attest.

While I was never a participant in the study abroad program, my living situation is relatively congruent with theirs. When I am in La Esquina, I live with my host family, sleep in my own room, and receive three meals a day. Because I live with my host family for such long periods of time (75 days in 2013, and 65 days in 2014) my diet is much closer to a normal diet for La Esquina than the diet my host-mom provides to a student. I'm sure it has as much to do with the amount of effort required to prepare a separate meal for a student as it has to do with my integration into the community.

A student would get vegetables every day with lunch, usually in the form of *ensalada*, a mix of boiled chayote squash, and hard boiled eggs. I usually get *ensalada* at lunch for the first week

that I'm there, and then only two or three times a week for the rest of my stay. Every once in I while, my host-mom will surprise me with broccoli or carrots in my *ensalada* or by adding *castaña* (breadfruit) or *batata* (white sweet potato), two of my favorite foods, to my meal. The variety of fruits and vegetables offered to a student is much broader than what I receive. Students in the study abroad program also experience a broader variety of protein. Beef and pork are special because they are more expensive than chicken. It is both gratifying and frustrating to know that I have integrated into the household enough that they feed me chicken every day for six weeks. A student arrives in the house and we're eating pork or beef at least twice during their three week stay. Obviously, the "typical Dominican diet" that students in the program receive is significantly modified. Every household handles feeding the students differently, and judging from the conversations I've had with students and the other members of the Sunflower Project, other households do far more than mine to provide variety and "special" foods.

In addition to the seven -week study abroad program every summer, the professor who coordinates the program has added three one-week session that give students a whirlwind tour of public health in the Dominican Republic. That tour brings students to the campo for two days, during which students, in groups of four or five, eat lunch with local families. Students do not stay with families during their time in the campo.

Anthropologists & Mission Trips

The professor who coordinates the study abroad program has been working in the Dominican Republic for almost twenty years, first as a Peace Corps trainer, then as an anthropologist and public health student, and now as the study abroad coordinator. For most of her time in the

country, she has been strongly associated with La Esquina. Consequently, the community has been exposed to the study abroad program, various graduate level research projects, peace corps projects, and, more recently, mission groups from a small episcopal church in Texas.

My first exposure to La Esquina was on one such mission trip. We visited the community for five days and ate lunch with the same household each day, similarly to the students in the one-week programs. Since the summer of 2010, when the mission trips began, children throughout the community have received new school uniforms, households have received bilingual bibles and other gifts, and local infrastructure has been improved to a small degree. Some of the mission groups' work has recently been undone and redone by the government's work in the schools.

Communication

All of this outside influence has made an impression on the community. One of the most tangible signs of that influence is the internet center. The internet center was opened a few years ago by a member of the community in response to both the study abroad students' demand for internet and the growing number of local community members taking university courses online. A side effect of the educational benefits the internet has provided to the community is the growing number of youth and young adults with social media accounts. Study abroad students and their families once depended on the dubious cell phone signal in the community to communicate after students had gone back to the United States. Now students can send a message for free to their host-siblings and friends in La Esquina (where drinking water arrives in a truck and the electricity goes out regularly) and those siblings and friends can respond the next time they

check their account for 30 pesos (less than US$1) an hour. The youth in the campo have a much broader view of the world than they had just five years ago. That view is being widened every day as smart phones hit the market and data plans become popular. One night during a brief visit to La Esquina in 2015, the program director and I discussed the probable fate of the internet center as houses and business in the area begin installing wifi and allowing friends and customers to use it for free. Wifi has not fixed the single transistor in the center of the community, which sparks and surges regularly. Infrastructure has not yet caught up to technology.

Nutritional Influences

Study abroad students have influenced their host families beyond their summer stay by exposing them to new ideas about healthy eating and exercise. According to the professor who coordinates the program, the idea of going for a run or a walk as a form of exercise was met with raised eyebrows and incredulous expressions just under a decade ago. Now, there is a group of women that meet once or twice a week for a brisk one and a half-mile walk. This change is partially due to countrywide awareness of diabetes and the benefits of exercise that is promoted by televised ad campaigns, but some of the women in the group are host-moms, and they sometimes use the activity as a way to bond with their students.

In general, attitudes about exercise have become more positive. Students have made less of an impact on long-term food practices, but the knowledge they impart to their host families about food practices in the United States has given host-families a greater understanding of nutrition

and made them more open to different ideas about food. That openness to change is a key factor in the potential success of the Sunflower Project.

The Sunflower Project in Practice

While the Sunflower Project was initially designed for daily interactions in traditional classrooms like those at Faro de Cabrera, the program director has created a summer camp version of the program that is meant to be hosted once a week over the course of ten weeks in an informal setting. This summer camp version was tested over the summer of 2014 and the responses were very positive. I was an assistant for the program, which we (the program director, another original group member, and I) tested in three different schools near La Esquina, including La Capilla. We visited each school for three hours once a week and attempted to keep lessons congruent between locations. Each location took a different number of weeks to gain an average attendance because of other factors beyond our control.

The first week, only the primary school in El Callejón, which serves first through fifth graders in a single room during the year, actually hosted a camp. The children in El Callejón were by far our youngest group of students, with an age range of 4-12, and an estimated average age of 8. As a result, more time had to be spent teaching, especially during writing activities. It was obvious to me that this camp was the first exposure some of the younger children had to writing on their own, and that some of the older children lacked confidence in their skills. El Callejón maintained an attendance of 12-18 students each week, with some children consistently arriving late or leaving early.

The school in El Pujador, which serves first through eighth-graders, was hosting national exams on the first day of camp. We decided to take the opportunity to set-up our materials for the next week and leave them in the classroom the school let us use. El Pujador is the farthest school from our home base in La Esquina and it was also the most cooperative as far as teacher participation and community awareness. The director of the primary school in El Pujador was an excellent conduit for information, spreading the word to her community, encouraging participation, and arranging for us to speak at the annual community meeting in which students receive their grades for the year. With her help, the second week of camps in El Pujador reached about 20 students, and that number grew to 30 or so over the course of the summer as word spread via participants. We hosted a broader age range at El Pujador, with children as young as five interacting with twelve and thirteen-year-olds. In many cases, we took advantage of the children's tendency to divide into groups according to age range and each of us focused on a different group during activities. Hosting the camp at El Pujador was a substantial amount of work for three people, but our grouping system made the work more efficient.

La Capilla is home to another primary school (1^{st} – 8^{th} grade) and the high school that serves five communities in the area, including El Pujador and El Callejón. Before the 2014-2015 school year began, the school system operated on half-days, allowing the high school and the basic school to operate out of the same building. With the near completion of the new high school building and the impending transition to the full school day, the primary school and the high school are under separate administrations. The administration at La Capilla is not as organized as that of El Pujador and the overall community involvement in the school is limited. The program director had been volunteering as an English teacher at La Capilla for an entire academic year, promoting

the summer camps for weeks, and still, no one from La Capilla attended the first week of camp, and only a few were present for the second week.

Community awareness grew after we spoke at the community meeting, which was largely attended by mothers anxious to know if their child passed his classes. There was little tangible support from school administrators, though parents and community leaders present at the meeting were very supportive. Attendance at La Capilla fluctuated in a similar manner to that of El Callejón, though after the third week we maintained an attendance of 18-25.

There was potential for conflict at the meeting in La Capilla when a well-respected member of the community raised the question of when camps were to be held in Pozo Hondo, another community with a basic school that could benefit from our efforts. The program director handled it diplomatically, emphasizing that this was the first year for the program and that we were limited by time and resources. Community members were temporarily satisfied by our answer and the prospect of Pozo Hondo hosting a camp the next summer.

The Sunflower Project: Necessary?

On our thirty-minute walk home from the meeting in La Capilla, discussion ensued between the three of us. We were all in agreement, after two weeks of camps, that we would not be able to coordinate a camp in Pozo Hondo on such short notice, but that it might be worth investigating. We also discussed holding camps in Las Abejas, a much larger community nearby. Our discussion turned to the purpose of the Sunflower Project and who it was meant to help. From there I began to ask myself what basis we had for determining “need” in the communities we

served. The small piece of informal research that had encouraged us to start our adventure in 2013 had not been enough to discern depth of need in the area, nor had it painted a clear picture of the communities themselves. We knew enough to know that our project was likely to be accepted in the communities, but we were uncertain of our foundations.

We were operating under the belief that we were improving the lives of the people in the area, augmenting children's education in hopes that they would take lessons home to their parents, but we had no proof of what people already knew about health and nutrition, nor did we have data describing what people eat or how they eat it. We knew we were working in an impoverished area, but we didn't know the degree of that poverty or how much it varied. This struck me as a fundamental problem with the project. How were we to know that lessons were culturally, and economically, appropriate for the area? The program director has spent extensive time in the area, and has a clear idea of what a normal diet looks like, but she does not live with a family in the community, and is largely responsible for her own consumption habits. Her diet has been modified by the surrounding culture and the resources available, but she is not as subject to the forces of traditional Dominican eating habits as her students are likely to be. Most importantly, none of her observations have been systematically recorded. If she were to leave the project in the capable hands of another person, who may or may not understand the logic behind the program design, what basis would *they* have to maintain the curriculum?

Conclusion

With that in mind, I set out to record a basis for comparison. I wanted to learn about what people in the area were eating at home, how they were preparing it, and when they were eating it. I

wanted to know whether people saw a need for fruits and vegetables in their diet, and which fruits and vegetables were of interest. I also wanted to know what people have in the communities. Agricultural assets like crops and animals are an obvious marker of wealth, and wealth inequality, in agrarian settlements across the world. Having a basic, applicable measure of wealth for the area would give us an idea of what activities would be feasible for students to replicate at home. The details of the methods used in this investigation will be discussed in the next chapter.

CHAPTER III

METHODS

The methods used to collect data for this investigation are derived from my experiences conducting surveys in the *campo* and a basic knowledge of statistics, Spanish language, and anthropological theory. My previous work in the *campo*, collecting data for a survey about rural opinions of dental hygiene in the Dominican Republic, greatly influenced the phrasing of questions and the selection of subjects, as it was the basis on which I established rapport with many members of the community (Tisone and Kahar 2014). My knowledge of Spanish language and feedback from the program director helped in the phrasing of questions and their translation from English, though phrasing was continuously modified to provide clarification and sound more natural as subjects encountered difficulties with phrasing or demonstrated a preference for certain synonyms (see Appendix A). I was careful to maintain the meaning of each question, even as the language was modified, occasionally re-translating the survey with the aid of bilingual dictionary and my existing vocabulary.

Throughout the creation of the survey, I took care to quantify as many factors as possible, allowing that they could be relevant to local food ways and agricultural assets. I set a goal of thirty interviews or more so that statistical significance could be determined in the event of irregularities in the data and I tried to evenly distribute my sample among the communities of El Callejón and La Esquina del Callejón. I approached the responses from El Pujador as a statistical comparison, to see if food ways in El Pujador were affected by its distance from the main road. I

also requested that the program director complete the same survey as her neighbors to test whether her responses were significantly different from theirs.

Anthropological theory, in addition to my own experiences, contributed to my preparedness to approach the typical pitfalls of key-informant interviews and ethnography. As an interviewer, the greatest unknown is the interview subject, thus drawing into question the quality of every interview. In subsequent sections I will discuss the frequency of pitfalls such as suspicious subjects, over-eager subjects, and sidetracked interviews, and how I chose to handle them so as to ensure the quality of the data I collected (Bernard 2006).

This chapter begins with a description of the *campo* and the communities where data was collected. The community background section is then followed by a description of sampling and the thinking behind the survey. Then follows a description of how interviews were conduction and how results were collected. The final section of this chapter discusses the manner in which qualitative data was collected using digital photography.

Local background

The rural communities served by the Sunflower Project are pictured in Figure 3.1. The rural community of La Esquina del Callejón (depicted in red), my base of operations for the duration of this investigation, is located within two miles of the northern coast of the Dominican Republic, in the province of Maria Trinidad Sanchez, about 15 miles from the state capital, Nagua (not pictured). The closest town on the map is La Entrada, which lies just to the southeast of La Esquina del Callejón, There is one main road that extends from the southern entrance on the coastal highway, 5 minutes past La Entrada and winds, climbing in altitude, through a series

of communities, including La Esquina del Callejón, until it arrives at the center of El Callejón, where the pavement diverts to La Capilla, the location of the high school that serves the area and one of our summer camp sites.

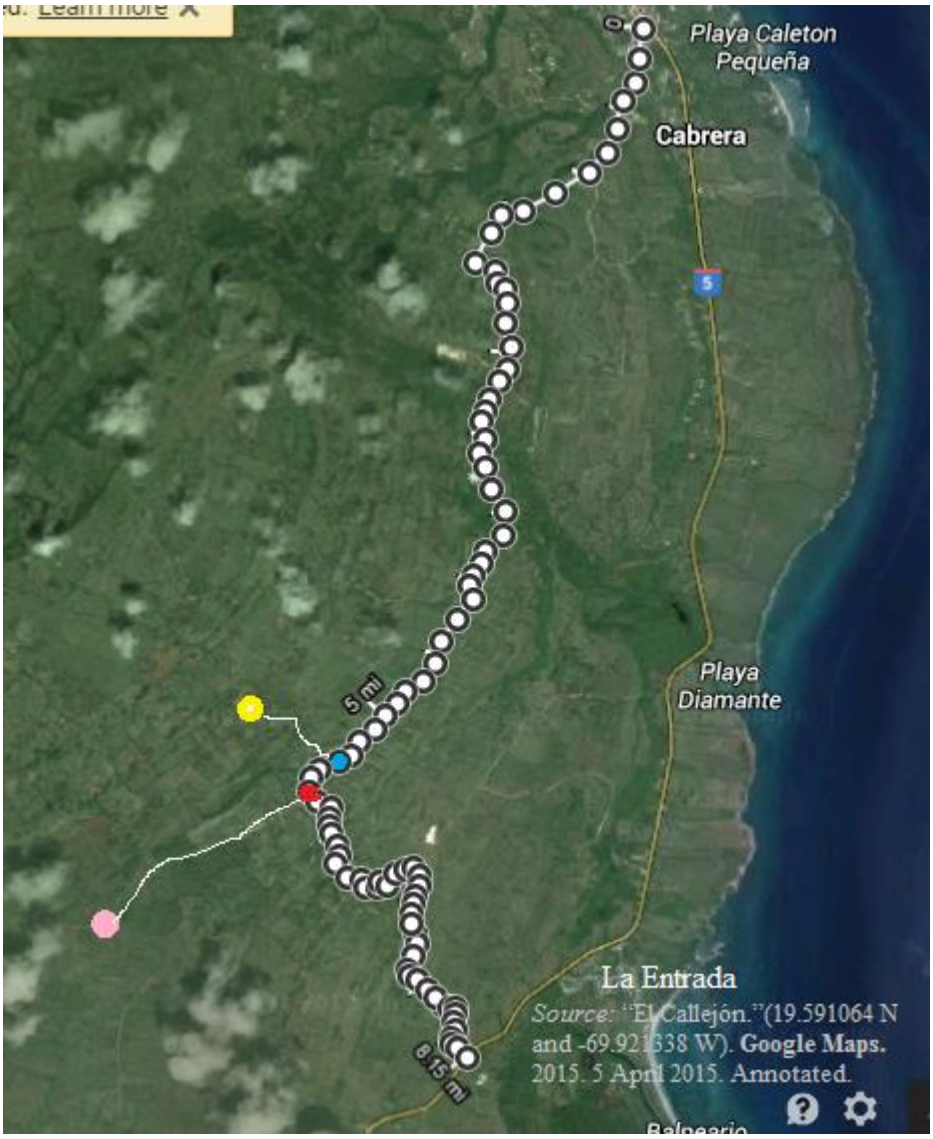

Figure 3.1. El callejón (the big road; the dotted line) extends from Cabrera to just past the community of La Entrada on Highway 5. The community of El Pujador (pink) lies south of this road, and La Capilla (yellow) lies to the west of it.

Just on the other side of El Callejón (depicted in blue), the main road continues, unpaved, lined with farmland and a few homes. The un-paved section of *el callejón* (the big road) effectively separates the northern section of the road from the southern section, where I've done my research. A few miles down the road from the community of El Callejón, the pavement begins again and continues to wind its way northwest, first climbing and then falling down the mountainside towards the town of Cabrera. Where the pavement begins again the population density increases, as does commercial activity. For the purpose of this paper, I define El Callejón as the area served by the Sunflower Project that lies between La Esquina del Callejón and the area of the road just passed where the pavement turns up to La Capilla. I consider these areas to be separate communities, or neighborhoods, along the long stretch of *el callejón*, which could be described as a secondary passage that runs parallel to the artery of the coastal highway, as shown in Figure 3.1.

Each community along the road is defined by a commercial center as shown in Figure 3.2. The commercial center of El Callejón contains three salons, a colmado, a church, a multi-purpose building used by local social and religious groups, and a live music venue called 20-20. Within walking distance of 20-20 and the end of the pavement, towards the northeast, is the closest primary school, which serves first through fifth grades during the school year. Another of the summer camp sessions was located at this school. I am not as familiar with El Callejón or its commercial center because I have spent most of my time in La Esquina del Callejón, which I will call La Esquina for the rest of this paper.

Figure 3.2. The commercial centers of La Esquina (red) and El Callejón (blue) are located within half a mile of each other along the main road.

The corner (*la esquina*), where the main road splits off toward El Pujador, is commercially important because of the *colmado*, or general store, on the western corner of the intersection, the feed store on the south corner, the two *bancas*, or lottery ticket sale points, and the small string of service-oriented business lining the north-eastern side of the t-shaped intersection (see Figure 3.3). La Esquina is generally more active than El Callejón because it has a higher population density, and it is a major way-point for people travelling to El Pujador from the main road. Several of the businesses on the corner are owned by one family. One sister runs the colmado. Another sister runs a bar that sells beer and provides a gathering point for most of the men in the

area to play dominos and socialize on the weekends. Her son runs a carwash next door to the bar. Less than 50 feet from the carwash is a small cafeteria that sells toasted sandwiches and is run by another member of the same family. Both sisters' homes are adjacent to their businesses. There are at total of three businesses on the corner that are not owned or operated by a member of their family.

Figure 3.3. La Esquina is a major commercial center because of the colmado (red square), the bancas (yellow diamonds), the feed store (orange square) and the service oriented businesses along the northeastern corner (green rectangle).

Both *bancas* (lottery ticket sale points) are owned by separate companies, and they each employ one or two local women who are in charge of selling lottery tickets. The orange *banca* serves as an intermediary between the residents and a few of the major cell phone companies by selling cell phone minutes. The blue *banca* lies immediately adjacent to the feed store.

The feed store stands as the only locally owned and operated business without ties to the family that commercially dominates the corner. It has been in operation for less than two years. The proprietor of the feed store is 25 years old and has been in the community for about as long as his business. He maintains one full-time employee and when he needs more help, he hires one or two of his other friends for an afternoon. The feed store is invariably populated with young males of all ages because of the friendships that exist between the owner and the other boys in the community.

Those who live immediately adjacent to the corner and these local businesses are a mix of the poorest and the richest members of the community. Houses range from one room shacks made of corrugated sheet metal to large, rambling cement block homes with five rooms or more. The owners of these homes are constantly involved in the activities at the corner, both socially and economically. The program director has settled in one of the small wooden houses in this area, allowing her to observe the community and participate in daily life. The families living adjacent to the corner are well established in the area, if not in their current locations. Family household size fluctuates with the holidays and school vacations as grandchildren and cousins visit or stay for long periods of time. The heart of La Esquina is essentially from the feed store to the internet center (the blue rectangle in Figure 3.3) located just past the bend in the road as continues to

climb. The *gallera*, a cock-fighting ring (the red circle in Figure 3.3) marks the lateral boundary of most of the activity in La Esquina.

Figure 3.4. El Pujador (pink) is located about one and a half miles to the southwest of La Esquina (red).

The school in El Pujador was the third location of our summer camps. The community of El Pujador is more established than La Esquina and has a larger population. El Pujador has its own community square, a paved park area with benches and tables, and the variety of businesses near the square is greater than that of La Esquina (See Figure 3.4). In addition to the *colmado* in El Pujador, which is larger than the one in La Esquina, there is also a larger feed store and a small restaurant that serves ice cream and snacks. El Pujador also benefits from the presence of baseball fields and a small cheese factory. The greatest challenge to collecting data in El Pujador was its distance from La Esquina. Data was collected in El Pujador on days when I was already in the community for summer camps, and the sample from El Pujador was very small. My

familiarity with El Pujador is even more limited than my familiarity with El Callejón, leaving me with a limited number of places to start establishing community connections, and far too little time to do it correctly. The few interviews that I did collect from El Pujador will act as a comparative sample to that of La Esquina and El Callejón.

Sample Collection

Data collection relied on my existing rapport within the communities. Collection was done on the basis of convenience and familiarity, with slight considerations toward gathering a sample that properly reflected the demographics of the community based on age and wealth without excluding any given group. All subjects chosen as household representatives were women who cook for or manage a household. I targeted women because of their close relationship with food, both cooking and procuring it, and their closer ties to the nutrition and education of their children and grandchildren. Throughout sample collection, I contemplated the idea of interviewing male subjects, as there are a few households where young men are known to live and cook for themselves. However, these households do not support children, which would have made their answers less relevant to the purpose of the study, which is aimed at collecting information immediately relevant to The Sunflower Project. Interviewing men would also have created more variation and another level of analysis in an already small sample size. The male perspective on food and nutrition in the *campo* remains unexplored.

The community of La Esquina is not exactly unfamiliar with my propensity for asking questions and writing down the responses. Most community members have been interviewed at one point or another either by me or a student participating in the study abroad program that visits the community every year. Many community members seem to realize that the projects I conduct,

which have required consent, are slightly more official than the small comparative projects conducted by the study abroad students. The communities of El Callejón and El Pujador are much less familiar with the process of survey research, but I did not encounter any resistance to the process, though more explanation was necessary. In El Pujador and El Callejón I had to rely heavily on my association with the Sunflower Project and my friendships with the program director and some of the students to facilitate contact with subjects.

Community Delineations

The way sample lines were drawn was based on my impressions of the communities. Initially, each community was defined by a commercial center. Community membership was defined by the observed social and commercial interactions with that center. For the purpose of this study, the north-western boundary of La Esquina is defined at a building that was recently converted into a new *colmado*, approximately 100 yards north-west of the internet center. This delineation was selected because of the gap between residences along the road and the informally observed frequency of residents from those households in La Esquina. Sampling stopped just below this imaginary line and began again about two residencies past the line to further define the division. The southern boundary of La Esquina is undefined, as sampling stopped short of where residents began to change how they defined their community of residence.

All sampling from El Callejón took place within 100ft of the paved road. Community members of El Callejón are spread out along the road on larger lots, which means there are fewer households per hundred feet than La Esquina. There is also more farmland, on which there are no residences, in the area designated as El Callejón. The pavement stops just past the commercial

center, but the community. The decision to separate La Esquina from El Callejón was made before data collection began, in preparation for variation between the two areas because of their association with different commercial centers. Discussion of the validity of this separation will follow in the next chapter.

Unlike El Callejón and La Esquina, the community center of El Pujador is officially designated and cared for by the community itself. Sampling from El Pujador was limited due to time and the lack of existing rapport in the community. As a result, only two interviews were collected from El Pujador. These two interviews will serve to indicate any major variations in resources or traditions between El Pujador and the other communities. I expected certain answers to differ from the average of the other two communities because of El Pujador's distance from the main road. With more time I would have liked to properly sample El Pujador in order to highlight any differences or similarities in reported food habits or economic resources.

A handful of survey responses came from households along the road between La Esquina and El Pujador. This area was not evenly sampled, as I was walking from La Esquina to collect interviews, which brought me to households on the La Esquina end of the road. Even so, these households do not clearly associate themselves with one community or the other, so they are defined as their own group. These homes are also separated by significant landholdings and, as I would learn during interviews, have stronger connections beyond the communities in which they live than they do within them.

Survey design

Content

The survey used for this investigation was created in sections with each section intended to accomplish a specific goal. Questions were modified throughout data collection to account for colloquialisms and phrases that were identical in meaning, but better understood by interview subjects.

The first ten questions of the survey are designed to gather basic nutritional information and insights into the local views on healthy eating and any accompanying obstacles. This section contains three of the four chart-style questions in which subjects were asked about the typical time of day to consume a food and the way that food is cooked. The first two charts cover 30 "traditional" foods, or foods the program director and I saw regularly while living with host families. "Traditional" foods include available meats (chicken, pork, beef, salami), grains (rice, bread, oatmeal), *vivere* (yuca, sweet potato, potato, etc.), diary (cheese, milk), and specialty dishes (sancocho, mofongo). The third chart question focuses exclusively on 45 fruits and vegetables that could be consumed in the area.

These chart questions establish a basic picture of eating habits, and help inform cultural assumptions used in lessons. Knowing what foods are breakfast-foods and what foods are usually served at lunch gives us an idea of what foods should be used in examples, and what modifications could be made most easily to local diet in order to improve nutrition. Knowing how foods are cooked gives us an idea of how much extra sugar or grease is added to a typical meal, and what other cooking and consumption methods can be substituted.

After the chart questions there are a couple questions about the desire or willingness to modify existing consumption levels or food habits. Some subjects had very strong opinions about what foods they would consume if they could, often listing their favorites or foods they had heard were very nutritious. The willingness demonstrated by interview subjects is a strong indicator of their general willingness to accept new ideas or practices that may be discussed in the program. Households that are interested in changing their diet would also be more likely to respond to new information discussed and demonstrated in summer camp lessons. There are also opinion questions about the importance of fruits and vegetables and the frequency with which they are consumed. Improving nutrition through increased fruit and vegetable consumption is an important goal of the Sunflower Project. These three questions address that goal and establish a baseline to which future data can be compared.

The final question in this section asks about the obstacles to fruits and vegetable consumption. Many people took longer to answer this question and it sometimes required clarification or discussion, as if it was something they had not considered previously. Answers to this question provide insight into the more practical reasons behind infrequent fruit and vegetable consumption, like cost, access, and storage. The Sunflower Project, with a maximum staff of three people and limited funding, cannot make vegetable trucks visit the community more often, make the fruits and vegetables cost less, or give everyone a way to store them. These are problems for a larger program. However, we can spread information and encourage consumption of fruits and vegetables. The subjects who believe there are no obstacles to fruit and vegetable

consumption, but still consume less than the recommended amount of fruits and vegetables, are the target audience of the Sunflower Project.

The next nine questions are designed to collect economic information to indicate the social and financial strength of each household in the sample. These questions did not ask directly about income or wealth, but focused more on the households' reliance on others, acquisition of food, existing food resources, and both traditional and non-traditional employment. Wealth was quantified according to the animal resources available to a household. Other wealth measures that were not recorded include house type, back-up power, and number of home appliances in a household. These factors vary mostly in the poorer households in the communities, who possess few animal resources and rely on one income source. These wealth measures were simply not considered during the creation of the survey. If they had been included, the lower end of the wealth distribution would likely have been more stretched out, increasing all inequality measures.

The economic stability of a typical household, and the range of economic situations in the *campo*, help determine the appropriateness of recommended take-home activities. Also, a child living in a household with more resources or a greater variety of resources, has a greater chance of having a stable nutritional environment. Conversely, a child living in a home where no one is working, social ties are limited, and agricultural resources are lacking, is more likely to experience fluctuations in nutrition as the household food supply changes with its income. Having an approximation of economic, and therefore nutritional, stability in the *campo* also tells me how susceptible my data is to change.

The final questions are used to gauge the immediate relevance of each interview to the Sunflower Project. The last three questions were only asked of households with children. The first offered me an opportunity to ensure that every household I interviewed knew about the summer camps being held nearby and gave parents the opportunity to ask questions about it. The questions that followed were meant to gauge participants' interest in the involvement of their children in Sunflower Project activities. Because of my involvement in the project, I already knew which households had children participating, and in many cases parents were very open about their enthusiasm and support for the program. These questions served to collect general opinions of the Sunflower Project among community members to ensure that, regardless of whether the Sunflower Project was necessary, it was not rejected by the community.

Formatting

The survey used for this investigation employed several question types in order to facilitate the organization of data.

Open ended questions were used in cases that would get quick responses from subjects. For instance, the first question "What foods are essential to the main meal of the day?" was left open ended because the answer should have been easy for most subjects and I was primarily interested in the variation of responses to this particular question. Other open ended questions, such as those regarding resources, were left open because of the sheer variety of potential responses. Question #20, "How many children do you care for in your household?" is open ended, but modified to allow for the collection of quantifiable data. I broke the question into four sub-

questions, each asking for the number of children in the household who fell in each age-group of children in the community. These age groups were: Under 5 years of age (too young for the program), 5-10 years of age, 11-13 years of age, and 14-18 years of age. This allowed me to gather data on the range of ages of children in each household, and in the community, and the overall number of children in each age group. Younger children would likely be involved in Sunflower Project activities longer, while older children were generally less likely to participate because of work and other activities.

Closed ended questions were used in cases where responses were likely to fall into a few broad categories. Several questions allowed for multiple responses and I took note of modified responses. For example, when asking about the frequency of fruit and vegetable consumption, some subjects broke the question down into two responses, indicating different frequencies for fruits and vegetables. I anticipated a difference in responses to fruits and vegetables vs. vívere , so question #6 is broken down into two parts. The coded answers allowed me to give subjects easy options and made quantifying the data easier.

Four questions on the survey were formatted as charts that were meant to be filled in with letter responses according to a bank of possible responses. The first chart asked about the time or times of day in which a certain food is typically consumed. The second inquired about the methods used to cook each food. The food selection for both of these questions was the same, allowing me to combine the charts on my response sheets. The third chart focused on fruits and vegetables and how they were typically consumed. Each chart has a list of coded responses, with an "Other" (O) option. By the end of data collection, I was scribbling words above my O's so that I would

be able to distinguish between popular cooking methods, which I had not considered when making the survey, that consequently fell into the all-encompassing category. These chart style questions offered opportunities to bond with subjects over favorite foods, and allowed some of them to educate me about certain cooking methods. The final chart on the survey is meant to collect data regarding animal resources in the household. I added information regarding quantity, age, and gender of animal resources if the information was volunteered by the subject. Some of the answers given to this final chart question were very detailed and indicative of the pride subjects felt about owning animals.

In hindsight, there are a few ways in which I could have made these chart questions more detailed, and potentially more accurate. While allowing for a simple yes or no response to each food in the first three charts wouldn't have contributed very much to the depth of the data collected, having options for "sometimes" and "rarely", which were responses offered for several foods, would have been helpful. In cases where those were the responses, they were hand written next to or in place of the responses to the existing questions. The final chart would have benefitted from a question about the quantity of each animal owned by a household, as every subject volunteered that information and it was recorded easily on hard copy response sheets and translated electronically.

I based the formatting of survey questions on the ease with which I could record answers and keep them organized. Questions were designed to encourage easy data collection over the course of an informal interview, in which responses would need to be recorded quickly so as not to disrupt conversation for more than a few seconds. The subjects were not asked to fill out the

survey so as to avoid embarrassment regarding illiteracy and to allow for a more relaxed interview environment.

Cultural Insights

Throughout the process of writing the survey, it was important to consider cultural and infrastructural differences between the U.S. and the Dominican Republic.

Items like strawberries, blueberries and pomegranates were removed from the initial draft of the survey. These fruits are hard to find outside of major metropolitan markets because food is less evenly distributed in the Dominican Republic compared to the U.S. Consequently, subjects have little context for these fruits. According to the program director of the Sunflower project, many of her students in Cabrera, a town with more resources than the communities in the *campo*, can recognize strawberries and blueberries from coloring books and pictures, but they have never eaten or seen them in person. It was reasonable to assume that berries and pomegranates would not be familiar to the residents of the *campo*. Kiwi and peaches were left on the survey because they are warm weather fruits and prior to the creation of the survey, I had heard them mentioned in conversation. They are not common fruits, but some community members have experience with them. Mushrooms were on the final survey, but they were later removed because of linguistic difficulties, which will be discussed in the next chapter.

The composition of a household had to be considered as well. In many cases, children are living with grandparents or cousins instead of parents, making it necessary to modify the question "How many children do you have?" to "How many children do you care for in your household?"

Several other survey questions were subject to cultural differences, from food procurement to potential obstacles to fruit and vegetable consumption. Several aspects were not considered, or were over considered. I will discuss these in the results section.

Interview Procedures

Data collection for this investigation lasted approximately three and a half weeks, during which I was living in La Esquina and working as an assistant with the Sunflower Project. All interviews were conducted in semi-public places, usually the front porches of homes, though there were a few instances of interviews taking place at or near local businesses. I conducted interviews using questions from a single hard copy of the survey and recorded responses on sheets of notebook paper. The answer sheets listed the question numbers and contained a hand-written duplicate of the chart-style questions regarding food.

I approached most subjects outside their homes or on their front porches at a time when they were not actively involved in conversation or interactions with others. Because of cultural norms, most interviews were conducted between the hours of 1pm and 5pm, when women are not occupied with cooking, a morning activity, and most other household members have left for work or play.

For the first half of the interviews, I asked questions in the order that they appear on the survey. Due to the amount of time the chart-style questions were taking to answer, I changed the question order and asked the chart-style questions at the end. This allowed for a more conversational start to the interview and made the interviews appear to go by more quickly.

I began every interview with an explanation of the study and a review of the consent form. I made sure to clarify any concerns with each subject before asking them to sign the consent form. A few subjects were initially suspicious about participation because of the formality of having to sign a form and go through the consent process. Those who had previously participated in interviews or surveys had been talking to students from the study abroad program, who conduct informal projects that are not intended to be published. The consent process was new and therefore a little strange. For more subjects, the most stressful aspect of the consent process was signing the form itself. I only asked subjects to sign the first line, either printing their name or using their signature, but even that for some was difficult because of illiteracy and struggles with penmanship. I printed their full names on the consent forms if they were not legible, and every name was recorded on each subject's response sheet. I did my best to keep subjects comfortable and move on quickly from the consent form to the interview.

Each interview lasted approximately 45 minutes, and most subjects were eager to offer extra information and discuss question responses more in depth. Some subjects were almost too eager to provide the "right" answer, which I noted in the notes I took in the margins of the interview response forms. Over-eagerness was the greatest concern throughout data collection. A couple subjects even asked if they'd given the right answer, to which I responded that any answer they gave me was correct, because I didn't know the right answer. The subjects in question were relieved to hear it and they became more comfortable and conversational with their responses. I tried to emphasize that the subjects were the experts and that I wanted to learn from them to make them more comfortable and reduce the tendency for subjects to tell me what they thought I

wanted to hear. I tried to keep subjects focused on the interview, but stories and additional explanations provided important qualitative data regarding the local socio-economic situation and the context in which the interview was taking place. There were only a few occasions in which interviews became sidetracked, and they lasted no more than a few minutes.

Recording Data

The response sheets used to record answers were made on notebook paper. Every question was written in pencil, and every response was written in pen to make responses easier to distinguish from question numbers when the sheets were digitally scanned and stored. The hard copy sheets were used as a way to conserve printing costs during the course of the investigation. They also allowed me to manipulate the amount of response space devoted to each question and left ample space for miscellaneous notes about the interview environment, relevant anecdotes, changes in attitude, and more specific responses. Hard copy responses were kept in a locked clipboard and were only removed for the purposes of electronic data recording.

All the information collected on hard-copy response sheets was transferred to electronic documents or spreadsheets within 48 hours of the end of the interview so as to maintain the integrity of the information collected. Many of the notes made on the interview sheets are in short-hand, or they are small pictograms describing a story. I was able to translate these notes into full stories electronically, where there was more space to properly write out the responses. There were also many unwritten details, such as my impressions of the subjects attitude toward certain questions and the process overall, that I recorded from memory in the electronic forms.

Word documents were initially used to record responses to questions 1, 12, 14, 19, 17-18, and to record miscellaneous notes (See Appendix A for a copy of the survey). Most of this data was either qualitative, or semi-qualitative. Excel spreadsheets were used to record data that could be easily quantified in order to show social norms and consumption tendencies. All chart-style questions were eventually converted into Excel spreadsheets, with every option given a column. A "1" was used to denote a positive response to any given option. Questions 17 and 18 were initially recorded together in a word document as semi-qualitative answers and later converted individually to spreadsheets.

Observations beyond the interviews

Throughout my time in the *campo*, I encountered information that was much easier to photograph than it was to describe. Shortly after interviews began, I found myself taking pictures of my meals, and pretty soon, the program director and interview subjects were showing me fruits and vegetables I had never seen nor heard of and letting me photograph them. Many foods were familiar to me once I saw them, but the name assigned to them was not what I expected. The pictures and descriptions of the various foods I encountered and the meals I ate during my time in the *campo* are recorded in Appendix B.

After conducting several interviews and realizing the number of people who rely on the *colmado* (local general store) for the bulk of their food supply and the *guaguas* (trucks) that bring fruits and vegetables to the *campo* a few times a week, I decided to informally document the selection provided by these two sources with photos. I could have easily asked the owner of the *colmado* for a list of her stock, but there was never a lull in business and I wasn't sure I would be able to

understand her record keeping. She was perfectly happy to let me take pictures of her store and record what I saw. There are three or four *guaguas* that serve El Callejón and La Esquina, and one of them occasionally turns toward El Pujador instead of continuing up the road. I seized the opportunity to photograph one *guagua* while the program director and her neighbor were buying vegetables one day. Pictures from the *colmado* and the *guagua* can be found in Appendix C.

Conclusion

The methods used to gather data in this investigation were the result of my previous experiences and the assumptions that come with them. Hours were spent designing the survey, considering the what-ifs, and thinking around corners, to ensure accurate data collection and appropriate compensation for the unknown. Throughout the data collection process, I made notes of things that should have been worded differently or questions that could have been thrown out, but resisted the urge to do so in order to maintain the integrity of the data collected. The addition of photographic evidence was an afterthought and proved to be a very entertaining way to record my observations. The results of these methods will be discussed in the next chapter. Not all of the data collected using these methods will be included in the results of this thesis.

CHAPTER IV

RESULTS

The results from the twenty-three questions asked of participants in this study provide a wealth of relevant background information for the Sunflower Project. Not all of the detailed results can be included in this paper. However, a reliable picture of the community can be painted using the over-arching concepts surrounding the survey questions. The first section will discuss nutrition from the perspective of overall dietary breadth by reviewing participants' responses when they were asked about the foods included in their typical diet. The next section will utilize information gathered from the questions assocaited with households animal resources and employment. This sections will also explain how economic indicators were quantified and how they relate to dietary breadth and weekly fruit and vegetable consumption. Following the discussion of inequality, the chapter will turn to geography, and attempt to account for the effect of distance to market. Distance to market is complicated by mobile markets that regularly visit the area. Finally, this chapter will explore the perceptions of participants with respect to nutrition by utilizing qualitiative information from a variety of survey questions and observations.

Dietary Breadth

A key factor in lessons and projects carried out as part of the Sunflower Project is the use of foods and meals that participating children would recognize. A total of 30 participants completed the interview. By recording the frequency with which participants confirm consuming certain foods, I ascertained the general breadth of their diets and the foods with which children would be familiar. Dietary breadth also contributes to general nutritional stability by demonstrating the

number of alternative foods families would consume in the event of a shortage. On average, participants reported consuming 64 of the 75 foods listed. The median number of foods consumed was 65, with a range of 21 foods (51 to 72). Most of the variation was found in fruit and vegetable consumption. Participants were not given a time frame to consider when asked if they typically consume a given food, when they eat it, and how they prepare it. A negative response was recorded when the participant either denied eating a food or described it as being rare.

An assessment of dietary breadth begins with an assessment of foods that are "traditional" and the frequency with which they are consumed. Figure 4.1 shows the number of participants who report eating certain foods deemed to be "normal" or "traditional" for the area. The list of "traditional" foods was assembled in close collaboration with the program director, relying heavily on her experiences living and working in the assessed communities. The data are color-coded by food group to allow for an analysis of the most commonly consumed items in each food group. For instance, the most common forms of protein are eggs and chicken, and the least are pork and peanuts.

The groups "protein", "diary", and "*vivere"* were created according to the PAN model discussed in Chapter 3. The "staple foods" group is composed of beans and rice and the various forms in which the two ingredients are eaten. It is important to note that beans, rice, *moro* (beans and rice cooked together), and *locrio* (rice combined with a meat or vegetable) are four separate foods in this cultural context. Because of the inclusion of rice in the "staple foods" group, other grains are separated into a group called "other grains". The "special occasions" group is composed of foods

that were primarily described by participants as “special”, meaning that they are not consumed frequently, but they are usually consumed in the context of a birthday, holiday, or other special occasion.

The data indicates that more participants consume proteins than consume dairy. The least commonly consumed “traditional” food was *mofongo*, which during interviews may have been interpreted by participants as *mangu*, another plantain-based dish (See Appendix B for a description of *mofongo* and other foods). Because of the potential for misinterpretations, confused reactions by participants, and the probability that some participants thought I just wanted a positive answer I will disregard *mofongo* as a traditional food to include in lessons.

Participants offered numerous explanations for abstaining from certain foods. The most common factor affecting the overall dietary breadth of participants was household preferences. During interviews, I was careful to communicate that I wanted to know what participants fed their families, not just what they themselves ate. Even in households where the participant was the picky eater, her preferences did not always affect the household diet. The second most common factor affecting overall dietary breadth was health, usually in the form of recommendations from a physician to consume more fruits, vegetables, and *vivere*, and reduce the consumption of rice, sugar, and fried foods. In these households it was more common for participants to report consumption of *trigo*, which can replace rice, and abstinence from sweet potato because of its sugar content. A few younger participants, whom I knew to have pursued higher education, expressed a desire to positively influence the health and weight of their families through food choice.

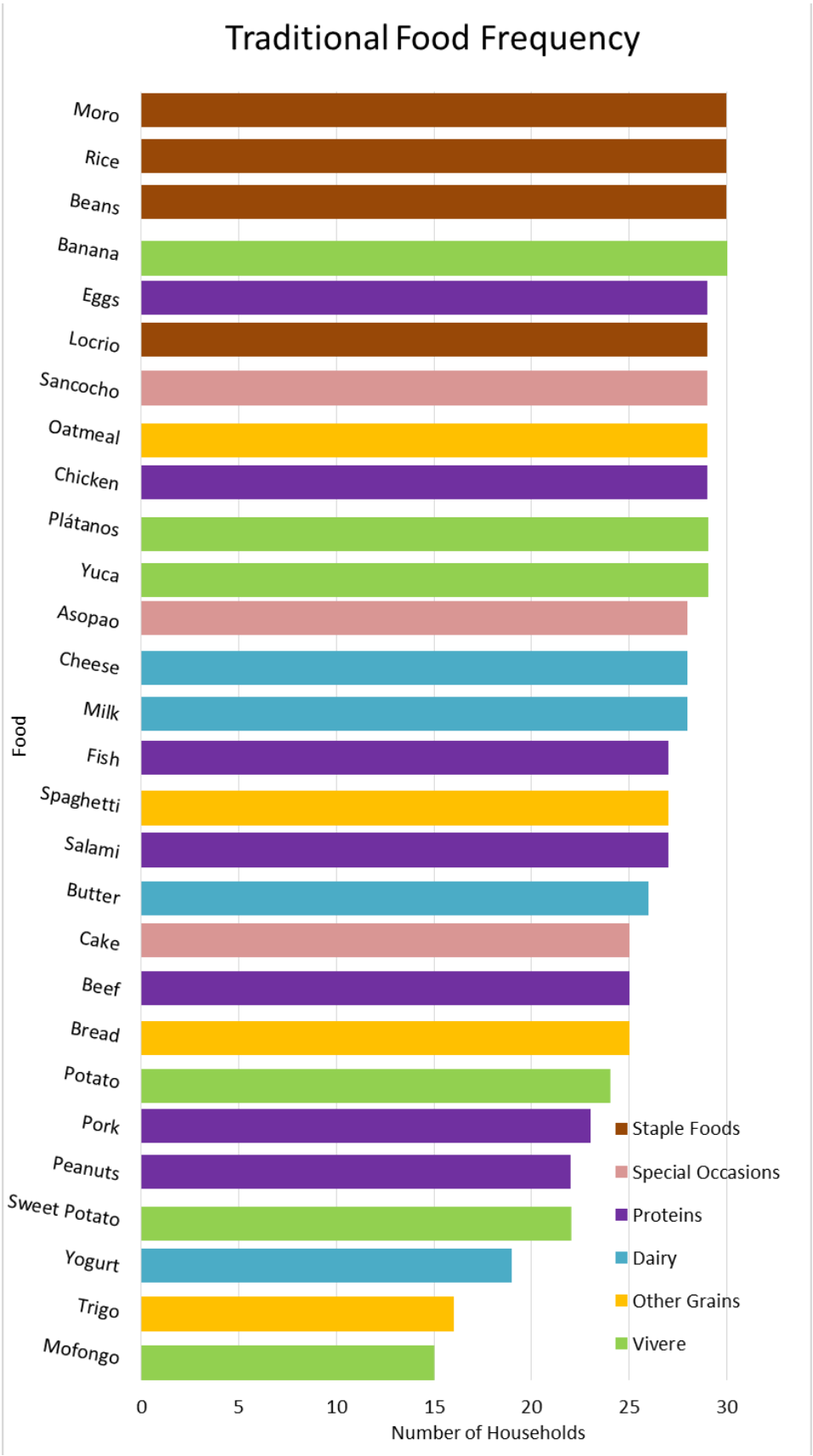

Figure 4.1 measures the number of participants who report eating certain foods deemed to be "normal" or "traditional" for the area, as determined by observations.

Fruits and vegetables are listed separately from the "traditional" food list because they are of particular interest to the Sunflower Project, which assumes that the frequency of fruit and vegetable consumption in rural areas is below standard dietary recommendations. Figure 4.2 shows the number of participants who report eating certain fruits and vegetables. Mushrooms were removed from the list after just a few interviews because of the strong reactions to the suggestion that one would eat *hongos*, the Spanish word used for fungus in general. It was difficult to convey the concept of mushrooms, the food, when participants were accustomed to associating *hongos* with decomposing food or itchy skin. Mushrooms were included in the list of fruits and vegetables in an attempt to create an extensive list, but I did not anticipate the translation problem. There may be people who eat mushrooms in the communities, but the disruption caused by the reaction of a few participants to the suggestion of *hongos* as a food was difficult to recover from.

The foods in Figure 4.2 are color-coded according to the traditional definitions of "fruits" and "vegetables" used in the PAN. The "other" group includes breadfruit and chestnuts, which are neither fruits nor vegetables. The "seasonings" group includes foods that most participants reported using primarily to season beans, meat, or soups. Grapes, which are consumed by 22 of the 30 participant households, were almost always associated with the month of December, indicating seasonality or an association with the Christmas season. Overall, Figure 4.2 depicts a general community preference towards fruits over vegetables, with the notable exception of ñame, the variety of yam grown and eaten in the area.

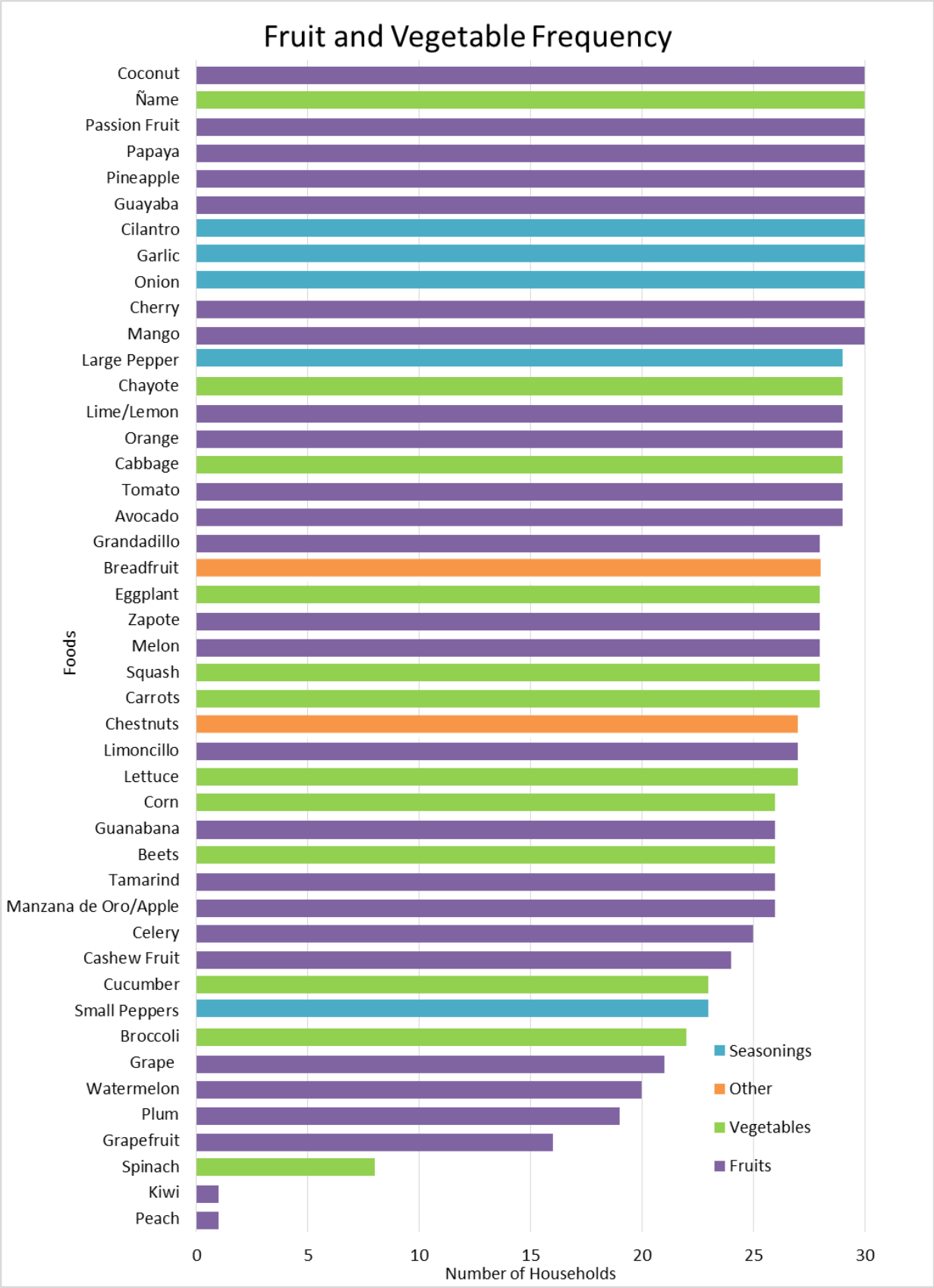

Figure 4.2. Measures the frequency with which households report consuming certain fruits and vegetables.

Inequality

Wealth + Income

After approximating the value of animal resources controlled by each household and the income garnered from various occupation types, I calculated the Gini coefficient and a corresponding Lorenz curve for combined wealth and income in the sample. Figure 4.3 shows the Lorenz curve for the sample, represented by the blue line, compared to a perfectly equal sample, depicted by the green line. The greater the bowing of the blue line away from the green, the more unequal the distribution of wealth between segments of the population.

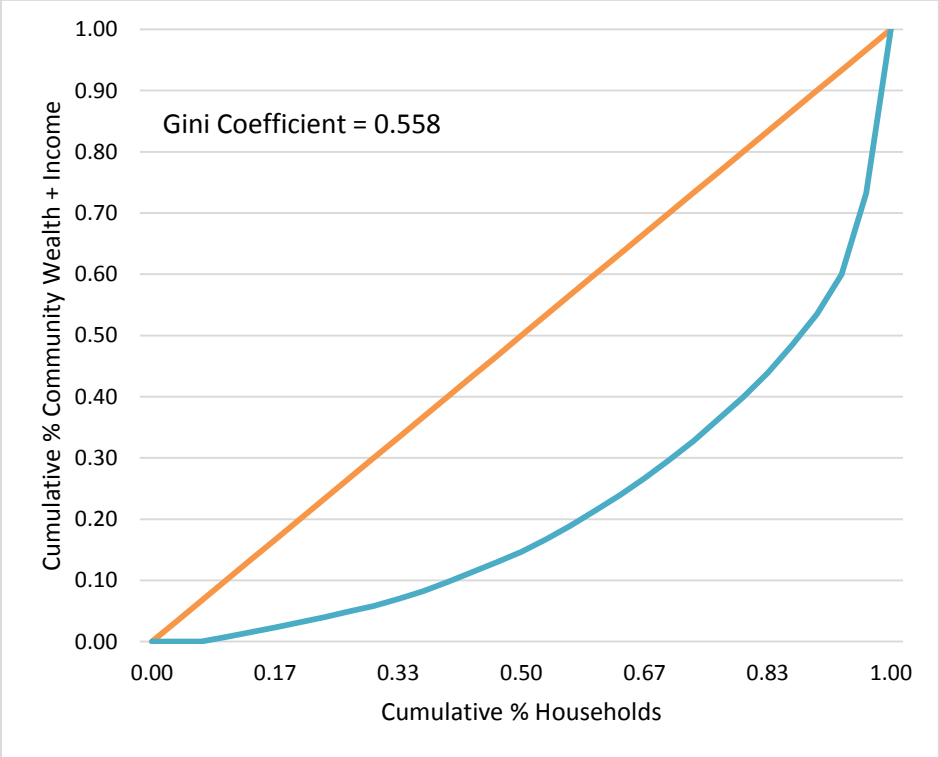

Figure 4.3 .The Lorenz curve is used to depict the degree to which a population differs from perfect equality by comparing the proportion of overall wealth controlled by each segment of the population.

As the survey did not ask directly for wealth or income, the data was estimated using the typical minimum wage of different occupation groups and the standard value of animal resources, as discerned from discussion with local agricultural workers, landowners, and public resources. The wealth figure is equal to the sum of the estimate of the cash each animal in a household would garner at market. The same figure is used to reflect the annual income from the production of each animal. For this reason, income is also reported in annual increments in Figure 4.3, despite likely inaccuracies that will be explained in the next section. All estimates are displayed in U.S. dollars, converted from the Dominican peso at a rate of 44.5 pesos per dollar. All of this information was extracted from the sample after annual combined wealth and income had been calculated for each household and the households had been rearranged in order from least wealthy to most wealthy.

The Gini Index is used by the World Bank to measure the inequality displayed in a Lorenz curve (World Bank 2015). Graphically, the Gini coefficient is represented by the area between the green and blue lines divided by the sum of the areas below the green line. Mathematically, the Gini coefficient is equal to 2 divided by the number of households squared times the mean, times the sum of the each household's deviation from the average wealth multiplied by their rank when arranged by least wealth to greatest. This calculation results in a Gini coefficient of 0.558. This number is meaningless by itself. Gini coefficients range from 0 to 1, 1 being perfectly equal (World Bank 2015). All the data can tell us about this community is that wealth is somewhat more unequally distributed than it is equally distributed, but not significantly.

The Gini coefficient for the Dominican Republic, as a country, was 0.457 in 2012 (World Bank 2015). With a Gini coefficient higher than the Dominican Republic as a whole, this sample is more unequal than the country in general, but this cannot be said with much confidence due to the small sample size. It is also important to note the distribution of incomes, which will be discussed in the next section.

Income

In the United States, the positive relationship between wealth and income is assumed. This exists to a certain degree throughout the Dominican Republic, especially in urban areas. In this particular community, however, wealth and income are not significantly associated, as shown in Figure 4.4.

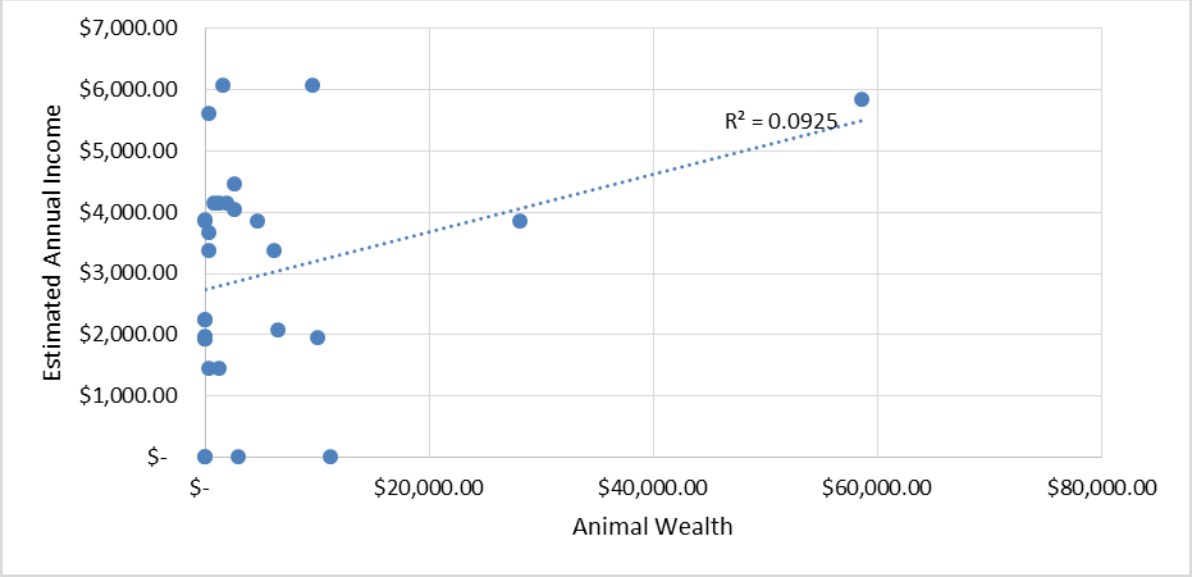

Figure 4.4. There is no significant correlation between animal wealth and annual income in the communities.

The extreme weakness of the relationship between animal wealth and annual income warrants separate treatment of the two factors. Figure 4.5 shows the Lorenz curve for income in the communities. Income inequality in this sample produces a Gini coefficient of 0.378. The variety of work available in the area contributes to reduced income inequality, as does the method of estimation employed to calculate income.

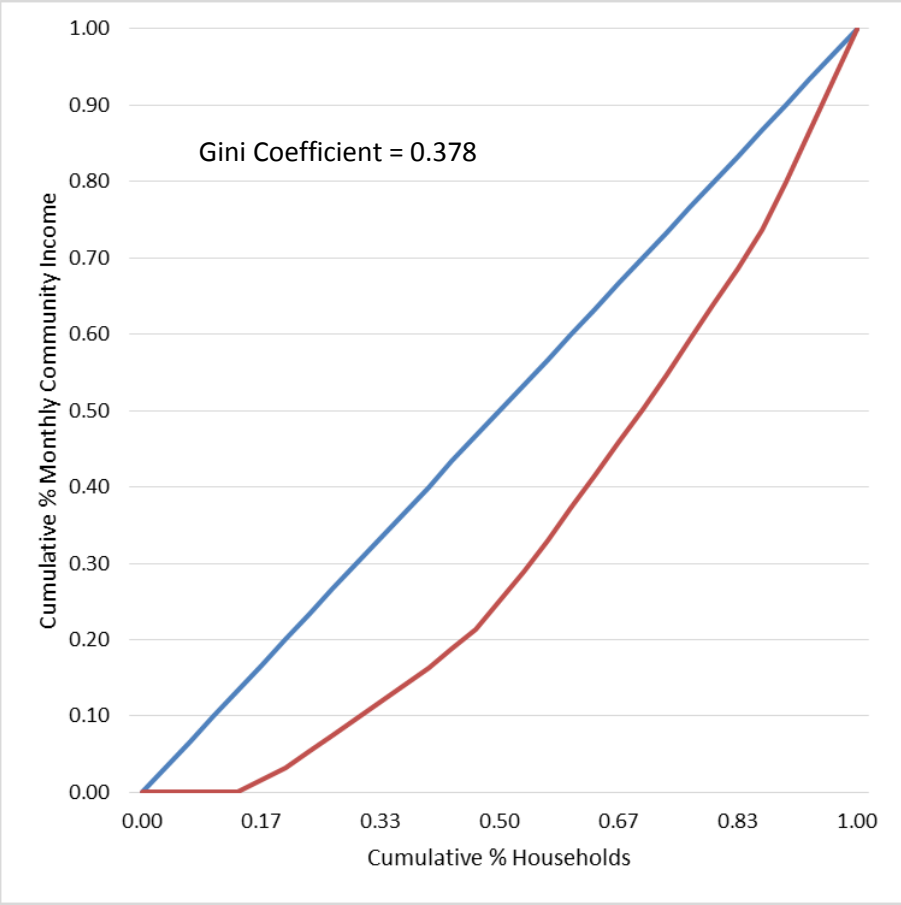

Figure 4.5. Income contributes less to inequality than wealth.

I chose to depict monthly income inequality instead of annual income inequality because of the inherent instability of work in the assessed communities. The figures I've estimated present an ideal case for the five categories of income I encountered during interviews (Manual Laborer,

Agricultural Worker/Home Business Owner, Agricultural Operator/Community Service Provider, Oustide Employment/ Significant Income from Remittances). Two-fifths of the households sampled depend on manual labor (construction/ odd jobs) or agricultural work as a source of income. In my estimates, I assumed that manual laborers received the same daily wage as agricultural workers, but worked fewer days on average. I calculated for an ideal month of manual labor, when only one day per week of available work was missed.

Income in the Campo

A more realistic situation is that of my friend Rodolfo (pseudonym). Rodolfo is a young man who depends on construction work to support his wife and child. For the first three weeks of my stay in the communities, he worked every day except for Saturday, when work was not offered. His job required him to drive an hour to and from Nagua each day. During the fourth week of my time in the campo, riots broke out in Nagua due to the recent electricity and water shortages. The construction site where Rodolfo worked was shut down temporarily. The riots passed, and with four days of work lost, Rodolfo returned to work for two more weeks. Then one morning the site supervisor stopped him on the road to Nagua and told him to go home because the construction company could no longer pay workers.

Rodolfo's brother, Miguel (pseudonym), experiences a greater level of stability as an agricultural worker, but the working conditions are significantly worse. Miguel can always find work harvesting avocados or limes, at the same daily rate as his brother, usually working longer hours. Their friend Alberto (pseudonym) has an ideal agricultural job, milking and herding cattle for a local landowner for a similar pay rate without the hassle of a commute. As long as Alberto's boss

continues to keep cattle and Alberto continues to do his job well, he will experience a steady flow of income.

Using a monthly income figure is more accurate than an annual income figure because of the fluctuations in labor demand experienced by community members like Rodolfo, Miguel, and Alberto. A monthly figure also helps compensate for fluctuations in income from remittances that households receive from family members living abroad and in other parts of the Dominican Republic.

Maria and Leon, a couple in their mid-sixties, receive remittances from their children in Santo Domingo, and they consider them to be a major part of their income. This tells me that their children have steady employment in the capital that they depend on to a certain degree. During the interview, Maria was reluctant to count her husband's feed store or her small household business as sources of income. When I asked her why, she told me it was because they earn so little. In response, I asked her whether her children help her, to which she nodded. Some households are more up front with their dependence on remittances. Camila, a grandmother who manages a small farm of her own, immediately counted her daughter Melinda, who lives in Spain and regularly sends money, as a working member of the household. Melinda's contribution to the household is not a family secret, nor is it a rarity.

For example, Imelda, who sells chicken and gasoline to support her household, has a son who has been working in the United States for years, and many young men from the community habitually migrate to work with him. However, she did not discuss her son's contribution to

household income. This leads me to believe that she either sustains her household on her own income sources or she does not receive remittances regularly enough to depend on them. I suspect the latter is the case, as manual labor is likely as unstable in the US as it is in the Dominican Republic, and cost of living in the US is much higher.

Poverty

Based on the income estimates made from the data, only a handful of households in the communities of El Pujador, La Esquina, and El Callejón live below the poverty line of $1.25 a day. Factoring in the wealth estimates from the data further support this conclusion, as do my observations. The data is missing a measure of household size, which would move most of the single income households much closer to, if not below, the poverty line. Several single income households support multiple children, which divides already unstable income sources even further. These households are more likely to feel the Sunflower Project's impact because of their children's participation in activities and lessons. The project needs to ensure that take-home activities are appropriate for these households.

However, households in the *campo* generally have enough food to feed themselves, whether they're purchasing it themselves or relying on friends and family to help them in tough times. Over half of the households surveyed receive food from friends and family. Compared to the United States, where cost of living and living standards are higher, the *campo* appears impoverished, but it's not. Generally, the major assumption made by myself, the program director, and the other founders of the Sunflower Project was technically wrong.

Dietary Breadth and Inequality

Regardless of poverty, inequality can be a major factor in nutrition, demonstrated clearly through the variety of food consumed by a household. Fortunately for these communities, wealth does not correlate strongly with dietary breadth. Figure 4.6 depicts the relationship between dietary breadth and combined wealth and income in the communities. The clearest demonstration of the effect of wealth on dietary breadth is one household with an annual combined wealth and income of around $65,000. This household is a dairy farm with 64 cows and three income earners. They have an agricultural operator, who owns the cattle, an agricultural worker, who manages the cattle and the sale of milk, and a household business owner, who sells shoes. Removing this household from the sample changes the mean wealth of these communities from $8000 to $6000 per year, and takes the Gini coefficient from 0.558 to 0.458, which is much more in line with my observations of the community. Interestingly enough, the wealth of this dairy farm does not correlate to a greater breadth of traditional foods or overall diet. The graphs depict the log of annual wealth + income in each household to eliminate some of the variance created by this household and demonstrate that wealth and dietary breadth are not significantly correlated.

It is important to note that Figures 4.6 and 4.7 do not represent the quantity of each food consumed or its frequency of consumption. A wealthy household that consumes fewer foods overall may consume more servings of each food more often. Conversely, a less wealthy household may consume a broader variety of foods at lower frequencies and quantities to compensate for the inability to consume more. I did not explore these facets of consumption in my interviews with participants.

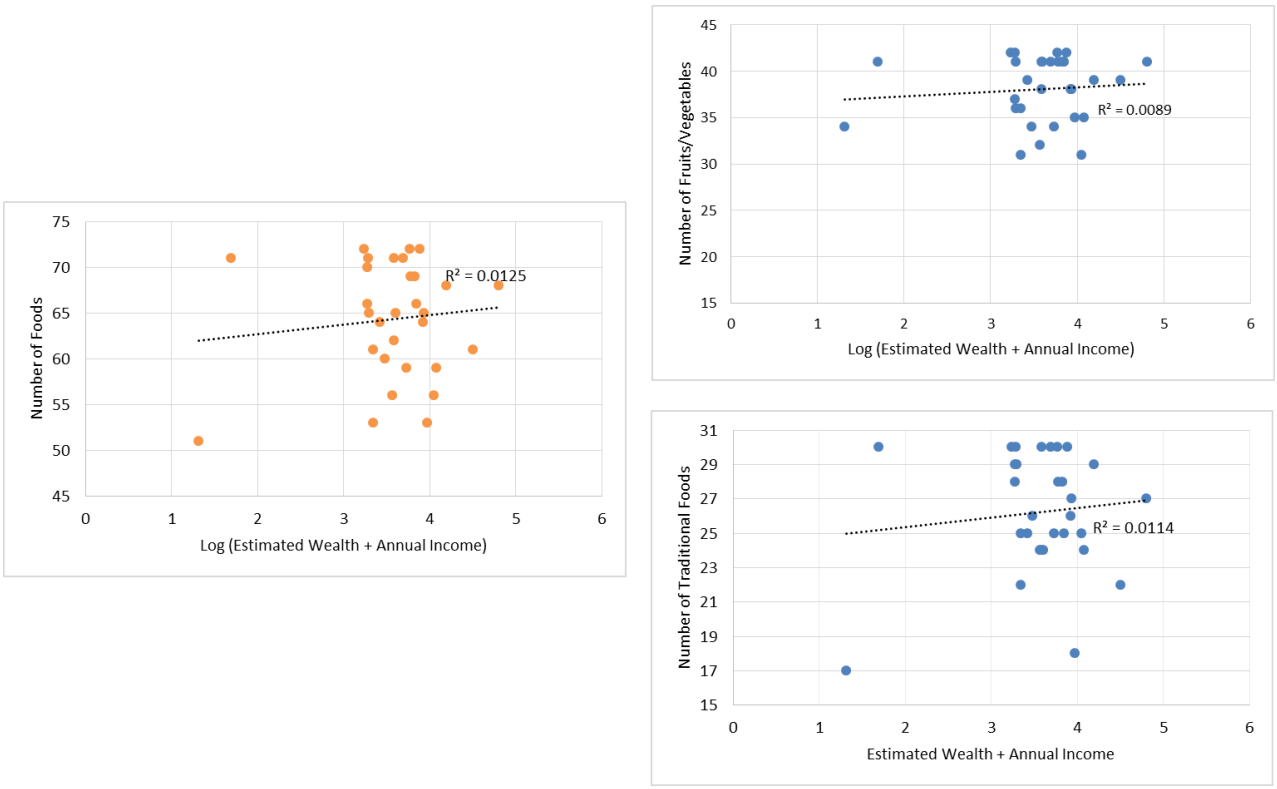

Figure 4.6. Comparison of the log of combined animal wealth and estimated annual income per household to the variety of foods consumed reveals no significant correlation. A total of 75 foods were discussed, 30 traditional foods and 45 different non-traditional fruits and vegetables.

Figure 4.7. There is a significant correlation between monthly income and the variety of foods consumed by the household

A comparison of monthly income and dietary breadth is depicted in Figure 4.7. There is a significant positive relationship between monthly income and the variety of foods consumed in a household. This indicates that income alone is a stronger correlate of dietary breadth than combined wealth and income.

This result has significant implications for the nutritional stability of households in the assessed communities because of the inherent instability of certain income groups, as previously discussed.

Inequality and Healthy Eating

Because of the Sunflower Project's specific interest in fruit and vegetable consumption, the next section will examine wealth, income, and the frequency with which households eat fruits and vegetables. Figure 4.8 demonstrates these relationships and the lack of correlation between the two factors. Fruit and vegetable consumption was recorded categorically in instances per week, and graphed according to the averages of each category. In a few instances, participants reported variable levels of consumption depending on seasons or types of food. These responses were averaged, creating some values that fell between horizontal axes on the graphs. According to these graphs, wealth and income do not correlate with the frequency with which households consume fruits and vegetables in a typical week.

Figure 4.8. An analysis of wealth and income and weekly fruit and vegetable consumption, as reported by participants, reveals no relationship

Location, Location, Location

Figure 4.9 is a map of the three communities in question, with the appropriate distanced between communities labelled. For a more satellite images of these communities, please review figures in the

Methods chapter of this paper. The location of these communities may play a part in fruit and vegetable consumption because of how far they are from Cabrera, the nearest town with a substantial produce supply. Cabrera does not offer all that the market in Nagua offers, but it's half an hour closer and half the cost on public transportation. Without a personal vehicle, travel to Cabrera requires a motorcycle taxi ride to the main road ($RD 100) and a ride on public transportation ($RD 40). A trip to and from Cabrera costs about US$ 6.25 which is more than most manual laborers and agricultural workers make in a day. Daily runs to the market are not sustainable for most households in the campo.

Figure 4.9. Participants living in El Pujador must travel about 18.5 km by way of La Esquina to reach a market

Community Location

As shown in Figure 4.9, distance to market is not the only factor to consider in this particular case because there are two directions associated with distance: continuing to climb past La Esquina to el

Callejón or turning on to the road to El Pujador. Figure 4.10 depicts each household's reported weekly frequency of fruit and vegetable consumption compared to their distance to the nearest market in Cabrera. Each household is identified by its community association.

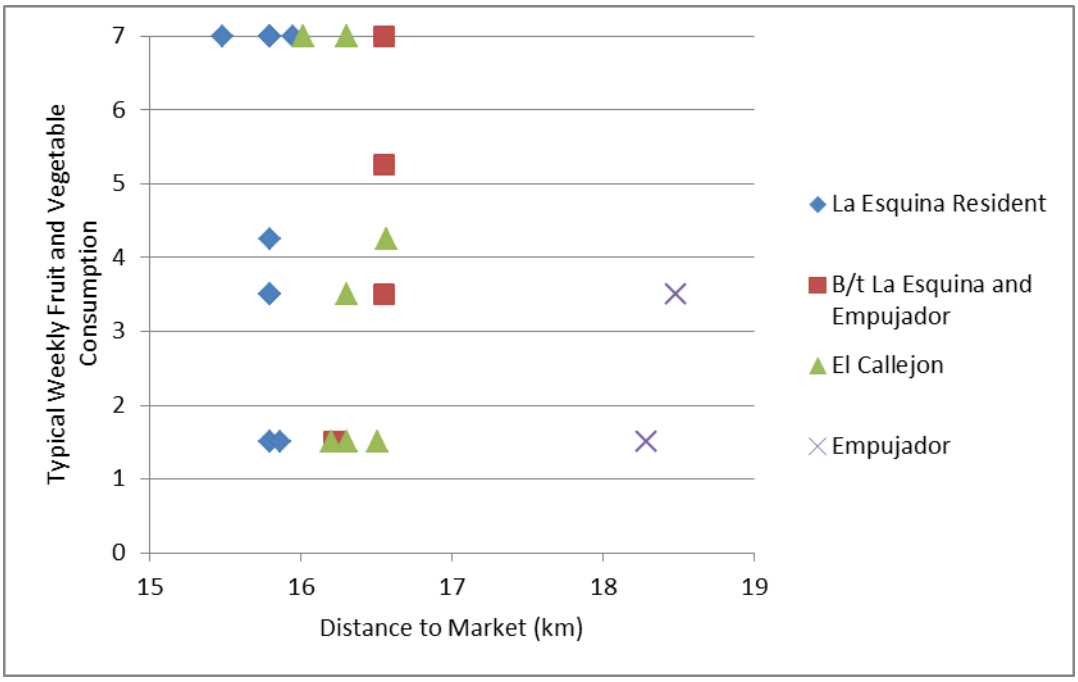

Figure 4.10. Comparison of distance to market and weekly fruit and vegetable consumption by household. Households are divided by community.

In general, the graph indicates that residents in the community of El Pujador may generally consume fewer fruits and vegetables per week than residents in La Esquina, or El Callejón. Two households were surveyed in El Pujador, making a definitive conclusion about fruit and vegetable consumption's relationship to distance to market difficult. The data is also complicated by some inconsistencies, particularly for the groups between La Esquina and El Pujador (red). In general, weekly fruit and vegetable consumption declines as distance to market increases. This is not necessarily true for the households between La Esquina and El Pujador. This irregularity in the data will be discussed in the next chapter.

Mobile Groceries

Fortunately, households do not have to travel to Cabrera to get fruits and vegetables. Most of the participants interviewed report purchasing food within a few kilometers of their homes, at the local *colmado* (general store) or from the mobile grocery trucks that come from Cabrera. The grocery trucks follow a consistent route from the entrance to the main road in the *campo*, through La Esquina and El Callejón as depicted in Figure 4.11.

Figure 4.11. The grocery route (yellow line) follows the main road through La Esquina and El Callejón

Over the course of seven weeks, I observed grocery trucks in La Esquina between 3 and 4 times each week. The grocery trucks appear more often than the water truck. There were a handful of occasions when a grocery truck would turn down the road to El Pujador to sell its wares, but on all other occasions

it continued up the road to El Callejón. Figure 4.12 shows the average weekly fruit and vegetable consumption for households grouped according to their relationship to the grocery truck routes.

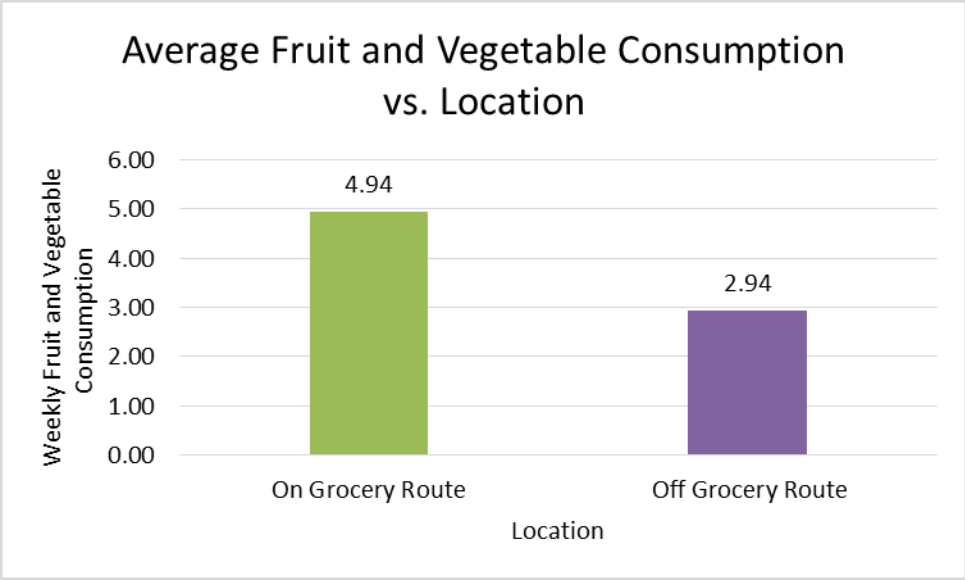

Figure 4.12. Houses located off of the main grocery truck route consume 2 fewer servings of fruits and vegetables per week on average than houses located on the main route.

An average household in La Esquina or El Callejón reported consuming fruits and vegetables two more times a week than an average household in El Pujador or between the communities of La Esquina and El Pujador. Any household in any of the four areas analyzed reported, on average, consuming fruits and vegetables about four times a week. The average of all households is skewed by a larger sampling of households on the grocery route than households off the grocery route.

Some households do not depend on mobile groceries or the *colmado* for food purchases. Three of the four houses interviewed between El Pujador and La Esquina, and two households in La

Esquina rely more on markets in Cabrera and Nagua than they rely on the *colmado* for normal food purchases. The *colmado* was only used in cases where something was accidentally forgotten on the grocery list or something was urgently needed. The majority of households located within a community rely on the *colmados* for their purchases. The houses further from community centers exhibit a greater level of independence, both logistically and socially. They are more likely to have significant land holdings and/or reliable access to a personal vehicle. The market-reliant households I interviewed tended to have other reasons to purchase food beyond their communities, most often work or family relationships in a market town. These households rely on a different consumption pattern than their *colmado*-reliant neighbors because of the way they acquire food. Instead of buying fruits and vegetables when they are available from mobile groceries, these households must budget their consumption for a weekly trip to the market and rely on storage to keep the food fresh. Food stored in refrigerators is vulnerable to extended power outages, which occur frequently in this area. The electrical current in this area also tends to surge, causing refrigerators to become freezers, ruining fruits and vegetables in a short period of time.

Community Perceptions

Every participant agreed that fruits and vegetables were important, and all but two would like to consume more and/or different fruits and vegetables. When asked what fruits and vegetables they would like to eat more of, participants generally wanted a greater variety, and fruits were mentioned more frequently than vegetables. While the variety of fruits and vegetables consumed in the communities seems high, it is important to remember that there was not a time component to dietary breadth. Fruits and vegetables are subject to seasonality in that costs fluctuate more

than availability as the national market's supply shifts between domestic and international providers. Households consume grapes, but only in December, when they are available. Avocado consumption spikes during the six month harvest period, but is largely absent the rest of the year. January through mid-March is the "scarce" season in this area, when most things are not ready to be harvested (Ministerio de Agricultura Republica Dominicana 2013).

The most desired fruits were mango, melon, and papaya, closely followed by pineapple and orange. The fact that participants want more mango and papaya is amusing to me, because the area is dotted with mango groves and papaya trees. Mangos are particularly popular among children, who usually acquire them by crawling over barbed wire fences, climbing trees, and harvesting them by hand. Mangos do not usually make it home on these ventures. Children are also not actively encouraged to spend their time hopping fences and climbing trees to harvest mangos, so it is unlikely that they really benefit from increased consumption. Papaya trees seem to be more strictly defined as private property than mango trees, since they can grow closer to homes. Melons are highly valued and correspondingly expensive when bought from the grocery trucks. Growing melons is likely a question of space. Few homes have room in their yards for a garden large enough to grow melons, and it is more profitable to put livestock in that space if they have it. None of the participants in the sample report growing melons. Oranges and pineapples are grown by a few households in the area and I have seen them in the grocery trucks, though they also tend to be more expensive.

The most desired vegetables were broccoli and carrots, followed by beets, cauliflower, and lettuce. All of these vegetables have two things in common: they can all be grown in small

quantities in a garden and they are all ground dwelling. The problem with ground dwelling vegetables is that they are seldom planted in raised beds or with barriers, creating a contamination hazard if they are placed in fields near livestock or sewage run-off. Clean water and low quantities of bleach are valuable, though not difficult to come by, and community members are aware of appropriate methods of washing vegetables, but consistently cleaning these vegetables might be difficult for poorer households. Broccoli and cauliflower are fairly new in this area, which means there will be a learning curve regarding the way to clean and cook them properly. This creates a few opportunities for the Sunflower Project that will be discussed in the next chapter.

Conclusion

When asked about obstacles to consumption, the majority of households who reported obstacles, pointed to access as the greatest difficulty, followed by cost and storage. The average household consumes fruits and vegetables about four times each week, the same number of times the grocery trucks come up the main road. This reflects a practice of consuming fruits and vegetables the day that they are bought, which indicates that storage may be more of an issue than participants realize.

Households that reported consuming fruits and vegetables every day tended to have a refrigerator or freezer with reliable power. Most, but not all, households have refrigerators. The few households who do not also lack stable electricity and back-up power, which are essential to the maintenance of a refrigerator. Basic household resources like electricity and appliances were not accounted for in this investigation. If they had been, there would have been a greater wealth

disparity among community members, and it may have associated more significantly with diet and nutrition.

Another underlying issue with storage is the fear of disease associated with vegetables, especially ground dwelling vegetables like lettuce. One participant, whose diet is already reduced by high blood pressure and pre-diabetic conditions, expressed her fears of vegetables during the interview. She knew they were healthy and that she needed to eat them, but her willingness to consume them had been influenced by previous experiences with food-borne illness. She still reported higher than average fruit and vegetable consumption for the area, specifying that she favored vegetables that are easy to clean.

Seven participants reported that they did not experience obstacles to consumption. Four reported that cost was the main issue. Most participants pointed to a combination of cost, access, and quality of produce. One reported that the main issue was that she could not get her family to eat fruits and vegetables.

It is important to remember that fruits and vegetables are separate from *vivere* in the Dominican categorization of foods. This means that foods like potatos, plantains, and yuca, all of which are highly nutritious, are excluded from fruits and vegetables. All but one household consumes *vivere* every day. The one household who doesn't consume *vivere* every day recently immigrated back to the Dominican Republic after spending nine years in Spain. This household's time in Spain altered its food preferences, increasing the frequency of fruit and vegetable consumption and decreasing its preference for *vivere*.

Overall, participants demonstrate a willingness to accept new foods and increase fruit and vegetable consumption. Some of the results presented above can be modified through the action of the Sunflower Project, though a few are beyond the Project's resources and abilities. The next chapter will discuss my recommendations based on these results and my overall evaluation of the area.

CHAPTER V

CONCLUSIONS

This project began as a way to inform and direct the Sunflower Project in ways that are culturally and economically appropriate. The quantitative background information gained through this investigation is invaluable to the Sunflower Project. Until this investigation, official research and analyses on these specific communities had not been conducted. The informal qualitative observations performed by the program director served to guide the initiative in a general direction, but all of the information was vulnerable to misinterpretations. The quantitative data collected in this investigation removes some of that vulnerability and provides substantive evidence upon which the Sunflower Project can grow and evolve. This project also represents an official record of qualitative observations from a second source that supports the initial informal observations of the program director. In the event that the program director needed more support for the initiative, it is my hope that this project would act as supporting research and validate her efforts.

Poverty

Generally, households in the area served by the Sunflower Project do not live below the poverty line. The few who do, receive help from friends and family to survive. The founders of the Sunflower Project made the wrong assumption. This is not cause, however, for the Sunflower Project to seek a more desperate population to fulfill its mission, in fact, the *campo* might be just the right level of "poor" for the Sunflower Project to be successful.

Impoverished communities generally lack infrastructure and food resources. If the Sunflower Project were to move to a community without the food resources (the *colmado* and mobile groceries) and the basic infrastructure (electricity, decent roads) of its current location, it would be starting from nothing instead of building on existing resources. Starting from nothing is a) more difficult and b) more likely to result in failure.

Poverty also effects the mindset of the impoverished. Households in the *campo* are not generally concerned with finding the next meal, or even making it through the week. There are probably moments in some households when resources run short, but the general tendency for neighbors to support each other works to alleviate the bulk of this concern. Not worrying about finding food for the next meal leaves people open to flexibility in their diets. The Sunflower Project depends on this openness to create change and improve nutrition. In a poorer area, the Sunflower Project would have to change tactics, likely requiring more resources, and it probably wouldn't be successful.

Nutrition & Inequality

Impoverished or not, the wealth and income of a household is an indicator of its nutritional stability. Households that rely solely on income, which anecdotal evidence indicates to be unstable in many cases, are more likely to experience fluctuations in nutrition due to shortages. Children in these households are likely shielded from some of these fluctuations by the preparation decisions of their female caregivers; however, fluctuations are likely still felt, especially in the case of households with multiple children (F. Catherine Johnson 1993). Households who rely on income for consumption and possess a few animal resources are more nutritionally stable than households without animal resources. Further statements on the effects

of wealth and income inequality are difficult to make because direct questions about income and wealth were not asked. The most appropriate action the Sunflower Project can take is to continue with activities with high nutritional impact potential and low resource requirements in order to ensure that as many participating children as possible can replicate activities at home.

The relationship between income, dietary breadth, and fruit and vegetable consumption is indicative of the reality most households face. When there is extra income, households are more likely to purchase more "traditional" foods instead of fruits and vegetables. Rice, beans, eggs, other "traditional" foods and convenience foods (chips, soft drinks, sweets) can be bought at the *colmado* (local general store) any day of the week at any time of day. This investigation did not account for the contribution of convenience foods to local diet. It is an avenue of research yet to be explored in this area.

Convenient access to fruits and vegetables in significant quantities is limited to three or four instances each week, reducing the probability that households will choose to purchase produce from the grocery trucks instead of foods from the *colmado*. The grocery trucks usually carry an assortment of peppers, tomatos, plantains, bananas, and yuca, with a few higher priced items like melons and pineapples. Household habits might change if the mobile groceries came every day, but the economics of such a decision are likely to be disadvantageous to the groceries. Because of the weak, unstable nature of the buying power (income) of the communities, mobile groceries would likely operate at a loss if they came from Cabrera every day.

This provides the Sunflower Project with the opportunity to help households provide for themselves on the days when the grocery trucks don't reach the communities. It is unlikely that a project of a size the program director can manage would cut into the market of the grocery trucks, especially if it focuses on fruits and vegetables that are scarce and rarely arrive in the trucks. The Sunflower Project cannot compete with the grocery trucks. Instead it should function to encourage families to grow some of their own food as a means to supplement their nutrition. The Sunflower Project may also be able to help with food storage in all households by encouraging the use of air-tight containers. Containers are a low-cost alternative to refrigerators, which require resources that poorer families may not have, and some households already use them to store certain food items. Using plastic or metal storage containers will eliminate the issues associated with storing fruits and vegetables in refrigerators that are too cold and too humid, but also keep fruits and vegetables clean and free of bugs.

The lessons taught through the Sunflower Project have the potential to make a greater impact in the areas outside the range of mobile grocery services. Households on and off the grocery route would benefit from use of container gardens and storage containers. The Sunflower Project should also explore gardening on a larger scale in El Pujador and between La Esquina and El Pujador. The program director would require substantial community support, as a community garden would be difficult for her to manage on her own. Any successful efforts at large-scale community gardening in El Pujador would not encroach on an existing fruit and vegetable market as they would in La Esquina and El Callejón.

Distance to Market

The households between El Pujador and La Esquina exhibit the beginnings of a quadratic relationship between distance to market /mobile grocery and weekly fruit and vegetable consumption that is supported by these households' food acquisition preferences. More data would need to be collected in this area and areas like it in order to find a relationship between distance to market and fruit and vegetable consumption in between-community households. The areas between communities are also more likely to be more unequal than community centers because of agricultural assets.

Distance to market does have an effect on fruit and vegetable consumption, as demonstrated by the lower average weekly fruit and vegetable consumption in households located away from the mobile grocery routes. Even when the market-reliant households between El Pujador and La Esquina, who generally have higher fruit and vegetable consumption, are grouped together with their *colmado*-reliant neighbors, the average weekly fruit and vegetable consumption of each household is two servings lower than the average weekly consumption of households living on the grocery route. This is probably due to two main factors. The obvious advantage to living on the mobile grocery route is shown in the data. Households who rely on markets must also alter consumption habits. These households must maintain reliable storage for fruits and vegetables. The differences in fruit and vegetable consumption between market-reliant households may be due to differences in storage capacity as well as individual preferences. More data collection is required to support this prediction.

The Sunflower Project and Future Research

Overall, the Sunflower Project should maintain its current focus on sustainability and expand to include workshops and activities with adults in the communities. Community members welcome the presence of the Sunflower Project, though the degree to which it can fulfill a need is currently unclear. Another evaluation similar to this one should be conducted in the future to determine whether the project has benefited the communities.

The program director should look into space-saving ways to grow melons to meet local demand for them. Melons are not currently grown by any of the participants interviewed, potentially because of the amount of space they occupy and the tendency for animals to destroy them. Growing melons on an A-frame or other apparatus would be easier for households to manage and protect. As this manner cultivation may appear strange, it would be best for the program director to test-drive the new method with the summer camp groups at one of the local schools, where the community can watch the melons grow and camp participants can participate in the gardening process. If it works, households in the community are more likely to replicate it.

The program director should also focus on carrots and tomatoes as a way to introduce the use of container gardens and raised beds. This should be achieved through the summer camps and a series of workshops for adults. Households already use container gardens for flowers. Carrots and tomatoes are favored vegetables that households are familiar with cleaning and preparing. Once community members become comfortable with growing vegetables in containers, the program director will be more able to encourage the cultivation of lettuce and other leafy vegetables in containers and raised beds. Throughout the process, the program director should

emphasize how raised-beds can prevent cross-contamination from sewage and agricultural run-off, thus avoiding the inherent dangers associated with consuming many vegetables. Raised beds should also be emphasized as a family project, in which every member of the household can participate in the construction and maintenance of a garden.

The program director should also investigate heat resistant varieties of broccoli and cauliflower to explore the feasibility of growing these vegetables in the area. If broccoli and cauliflower can be successful in this area, the program director should conduct workshops on the proper way to clean and prepare each food. Cooking workshops could also be an avenue to encourage healthier methods of preparing traditional foods. I have not yet analyzed the results of questions regarding food ways, which would provide the program director with direction in this area by describing the current behaviors associated with consuming and preparing foods. This analysis is the next step in my investigation.

Areas for future research to direct the Sunflower Project include an exploration of the educational background summer camp participants are receiving at school, and how that knowledge is likely to be affected by the recent country-wide transition to the full school day. Future research beyond the scope of the project may include an investigation of wealth, income, and market choice in households between communities, similar to those located between La Esquina and El Pujador.

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APPENDIX A

SURVEY MATERIAL

This appendix is home to the surveys used to collect data for this thesis. The first two images show the survey in English and Spanish, respectively, as it was originally formatted and worded. The final image is of the physical copy of the survey used to collect data, cropped and enlarged to make written notes more visible. The purpose of this appendix is to accurately document the modifications to wording and format that were carried out during the data collection process. The first change made was the elimination of foods from question 7 that had already been discussed in questions 3 and 4. This shortened the amount of time spent on question 7 by up to five minutes and eliminated any potential confusion on the part of subjects as to why they were being asked about certain foods for the second time. Subsequent changes were made to the language used to ask questions, such as the exchange of *calabazo*, the standard Spanish word for "squash", to *aullama*, the colloquialism used in the *campo*. I also wrote suggested language above or around places where it was appropriate, and key phrases used by subjects, like *picadera*, a word for "snack". All of these modifications were necessary because of my level of fluency in Spanish. There are at least two instances where I mistranslated words, but I caught the mistakes within the first two interviews and modified the survey to match its English translation.

English Version

Interview Questions (45 minutes):

1. What foods are essential to the main meal of the day?
2. How many meals does your family consume each day?
3. Which foods are breakfast foods (D)? Which foods are for lunch (C)? Which foods are for dinner (N)? Which foods are for special occasions (F)? Which foods do not fit in a category (O)?

_____Yucca	_____Plantains	_____Chicken	_____Eggs
_____Potatoes	_____Sweet Potato	_____Guineo (Banana)	_____Bread
_____Salami	_____Beef	_____Spaghetti	_____Beans
_____Rice	_____Avocado	_____Milk	_____Peanuts
_____Pork	_____Oats/Oatmeal	_____Wheat	_____Cornmeal
_____Cheese	_____Sancocho	_____Mofongo	_____Yogurt
_____Butter	_____Cake	_____Moro	_____Locrio
_____Fish	_____Asopao		

4. How do you eat the following foods: Baked (H), Fried(F), Boiled(R), Fresh (C) or another way(O)

_____Yucca	_____Plantains	_____Chicken	_____Eggs
_____Potatoes	_____Sweet Potato	_____Guineo (Banana)	_____Bread
_____Salami	_____Beef	_____Spaghetti	_____Beans
_____Rice	_____Avocado	_____Milk	_____Peanuts
_____Pork	_____Oats/Oatmeal	_____Wheat	_____Cornmeal
_____Cheese	_____Sancocho	_____Mofongo	_____Yogurt
_____Butter	_____Cake	_____Moro	_____Locrio

5. Do you think it is important for your family to eat fruits and vegetables? Why or why not?
6. How often does your family consume fruits or vegetables at home?
    a. Less than once a week
    b. 1-2 times a week
    c. 3-4 times a week
    d. 5-6 times a week
    e. Every day
7. What are the fruits and vegetables that you consume regularly and how do you consume them? Baked (H), Fried (F), Boiled (R), Fresh (c) or another method (O) (may add notes about seasons)

Mango		Cahuilla (Cashew Fruit)	Platains	Batata	Corn
Potatoes		Guineo (Banana)	Avocado	Apples	Mushroom
Tomatoes		Lettuce	Cabbage	Beans	Guayabana
Oranges		Limes/Lemons	Cherries	Limoncillo	Granadillo
Onions		Carrots	Chayote	Pumpkin/ squash	Coconut
Broccoli		Cantelope/Melon	Zapote	Tamarind	Yam
Peach		eggplant	Celery	Chestnut	Grapefruit
Breadfruit		Garlic	Cilantro/ Cilantrico	Beets	Watermelon
Spinach		Peppers	Plum	Grapes	Passion fruit

Bell Pepper		Cucumber	Kiwi	Guayaba	Papaya
Pineapple					

8. Do you wish you could consume more fruits and vegetables? Why or why not?
   a. Yes
   b. No
9. Do you wish you could consume different fruits and vegetables?
   a. Yes If yes, which ones? _____
   b. No
10. What is limiting you from consuming more/different fruits and vegetables?
    a. Income b. Availability c. Quality d. Storage e. No interest
11. How do you get your food?
    a. Buy it in the market
    b. Buy it at the general/convenient store
    c. Buy it off the farm or from a friend (or trade for it)
    d. Free from friends or family
    e. Grow it yourself on a farm or at home
12. What is a food you buy at the market?
13. About how much food does your family buy and how much does your family grow?
14. What do you grow during the year?
15. How much of what you grow do you sell? How much do you eat?
16. Do you have farm animals?
    a. Yes
    b. No
17. What animals do you have? (Optional: How many of each do you have? How many adults? How many young ones?)

Cows	Pigs	Chickens
Geese	Ducks	Dogs
Goats	Other	

18. What do the animals give you (Do you sell them, eat them, eat their produce or all of the above)?
19. How many people earn money in your family? What are the jobs that they have?
20. How many children do you care for/ are in your household? (If there are no children, the interview ends here)
    a. Under age 5 _____
    b. Age 5-10 _____
    c. Age 11-13_____
    d. Age 14 -18_____
21. Do you know about Alicen's summer program/ el Club del Verano? [Use Alicen's flyer to explain the program if the answer is "no", answer any questions]
22. Do your children participate? Why or Why not?
23. Would you like them to participate? Why or Why not?

Spanish Version

Parent Interview Questions (45 minutes):

1. ¿Cuáles comidas son esenciales a la comida?
2. ¿Cuantas veces come su familia cada día?
3. ¿Cuáles comidas son de desayuno (D)? ¿Cuáles comidas son de almuerzo (C)? ¿Cuáles comidas son de la cena (N)? ¿Cuáles comidas son de ocasiones especiales (E)? ¿Cuáles no caben en una categoría(O)?

_____Yuca	_____Plátanos	_____Pollo	_____Huevos
_____Papa	_____Batata	_____Guineo	_____Pan
_____Salami	_____Res	_____Espagueti	_____Habichuela
_____Arroz	_____Aguacate	_____Leche	_____Mani
_____carne de puerco	_____Avena	_____Trigo	_____Harina de Maiz
_____Queso	_____Sancocho	_____Mofongo	_____Yogur
_____Mantequilla	_____Biscocho/Pastel	_____Moro	_____Locrio
_____Pescado	_____Asopao		

4. Como se come estas comidas: Al Horno (H), Frito (F), Hervido (R), Fresco/Crudo (C), o de otra manera (O)?

_____Yuca	_____Plátanos	_____Pollo	_____Huevos
_____Patata	_____Batata	_____Guineo	_____Pan
_____Salami	_____Res	_____Espagueti	_____Habichuela
_____Arroz	_____Aguacate	_____Leche	_____Mani
_____carne de puerco	_____Avena	_____Trigo	_____Harina de Maiz
_____Queso	_____Sancocho	_____Mofongo	_____Yogur
_____Mantequilla	_____Biscocho/Pastel	_____Moro	_____Locrio

5. ¿Crees que es importante para su familia a comer frutas, verduras, y vívere? ¿Por qué o por qué no?
6. ¿Con que frecuencia consume su familia frutas o verduras en casa? ¿Con que frecuencia consume vívere?
    a. Menos que una vez a la semana
    b. 1-2 veces a la semana
    c. 3-4 veces a la semana
    d. 5-6 veces a la semana
    e. Cada día
7. ¿Cuáles son las frutas, vegetales, y vívere que consuma usualmente? ¿Cómo las consume? Al Horno (H), Frito (F), Hervido (R), Fresco/Crudo (C), o de otra manera (O)

Mango	Cahuilli	Plátanos	Batata
Papa	Guineo	Aguacate	Manzana/Manzana de oro
Tomate	Lechuga	Repollo	Habichuela
Naranja	Limón/ Lima	Cerezas	Limoncillo
Cebolla	Zanahoria	Chayote/Tayota	Calabazo

Broccoli	Melón	Zapote	Tamarindo
Durazno	Berenjena	Apio	Castaño de grano
Castaña	Ajo	Cilantro/Cilantrito	Remolacha
Espinaca	Ají pequeño	Ciruela	Uva
Ají grande	Pepino	Kiwi	Guayaba
Pina	Papaya/ Lechosa	Chinola	Sandia
Toronja	ñame	Coco	Granadillo
Guyabana	Hongos	Maiz	

8. ¿Quisiera consumir más frutas y vegetales? ¿Por qué o por qué no?
   a. Si
   b. No
9. ¿Quisiera consumir frutas y vegetales diferentes?
   a. Si Si sí, cuales? _____
   b. No
10. ¿Que se previene de consumir más o diferentes frutas o vegetales?
    a. Dinero b. Acceso c. Calidad d. Mantenimiento
    e. No hay interés
11. ¿Cómo obtiene la comida?
    a. Comprarlo de un mercado
    b. Comprarlo del colmado
    c. Comprarlo de un amigo o directamente de una granja/finca (o cambiar una cosa tuya por la comida)
    d. Recibirlo de familia o de amigos (gratis)
    e. Crecerlo/sembrarlo por tu mismo en una granja/finca/cerca/conuco o en casa
12. ¿Qué es una comida que compre en el mercado?
13. ¿Cuánta comida se compra su familia y cuánta se crece? (una proporción)
14. ¿Qué siembra/crece durante el año?
15. ¿De la comida que crece, cuanto se vende y cuanto se come en casa?
16. ¿Tiene animales de granja/finca?
    a. Si
    b. No
17. ¿Qué animales tiene? (Opcional: ¿Cuantas de cada uno tiene? ¿Cuántos adultos? Cuántos jóvenes?)

Vacas	Puercas	Gallinas
Graznas	Patos	Perros
Chivos	Otras	

18. ¿Qué les dan los animales? (¿Las vende, come, come los productos o todos?)
19. ¿Cuántas personas ganan dinero en su familia? ¿Qué trabajo tienen?
20. ¿Cuántos niños se cuida en su casa? (si no hay, la entrevista termina aquí)
    a. Menos de 5 años _____

b. 5-10 años _____

c. 11-13 años_____

d. 14 -18 años_____

21. ¿Ud. sabe del programa del verano que enseña Alicen? [Si contesta en el negativo, explique el programa y use el papelito, conteste preguntas]
22. ¿Participan sus niños? ¿Por qué o por qué no?
23. ¿Quisiera que participen los niños? ¿Por qué o por qué no?

The Field Version (Spanish)

Parent Interview Questions (45 minutes):

1. ¿Cuáles comidas (son esenciales) necesitan para la comida?
2. ¿Cuantas veces come su familia cada día? Cocina
3. ¿Cuáles comidas son de desayuno (D)? ¿Cuáles comidas son de almuerzo (C)? ¿Cuáles comidas son de la cena (N)? ¿Cuáles comidas son de ocasiones especiales (E)? ¿Cuáles no caben en una categoría(O)? ← Picodera (snacks)

_____Yuca	_____Plátanos	_____Pollo	_____Huevos
Papa _____~~Patata~~	_____Batata	_____Guineo	_____Pan
_____Salami	_____Res	_____Espagueti	_____Habichuela
_____Arroz	_____Aguacate	_____Leche	_____Mani
_____carne de puerco	_____Avena	_____Trigo	_____~~Harina de~~ Maiz
_____Queso	_____Sancocho	_____Mofongo	_____Yogur
_____Mantequilla	_____Biscocho/Pastel	_____Moro	_____Locrio
_____Pescado	_____Asopao		

4. Como se come estas comidas: Al Horno (H), Frito (F), Hervido (R), Fresco/Crudo (C), o de otra manera (O)?

_____Yuca	_____Plátanos	_____Pollo	_____Huevos
_____Patata	_____Batata	_____Guineo	_____Pan
_____Salami	_____Res	_____Espagueti	_____Habichuela
_____Arroz	_____Aguacate	_____Leche	_____Mani
_____carne de puerco	_____Avena	_____Trigo	_____Harina de Maiz
_____Queso	_____Sancocho	_____Mofongo	_____Yogur
_____Mantequilla	_____Biscocho/Pastel	_____Moro	_____Locrio

5. ¿Crees que es importante para su familia a comer frutas, verduras, y vívere? ¿Por qué o por qué no?
6. ¿Con que frecuencia consume su familia frutas o verduras en casa? ¿Con que frecuencia consume vívere?
    a. Menos que una vez a la semana
    b. 1-2 veces a la semana
    c. 3-4 veces a la semana
    d. 5-6 veces a la semana
    e. Cada día
7. ¿Cuáles son las frutas, vegetales, y vívere que consuma usualmente? ¿Cómo las consume? Al Horno (H), Frito (F), Hervido (R), Fresco/Crudo (C), o de otra manera (O)

Mango	Cahuilli	~~Plátanos~~	~~Batata~~
~~Patata~~ Papa	~~Guineo~~	~~Aguacate~~	Manzana/Manzana de oro
Tomate	Lechuga	~~Col~~ Repollo	~~Habichuela~~
Naranja	Limón/ Lima	Cerezas	Limoncillo
Cebolla	Zanahoria	Chayote/Tayota	~~Calabazo~~ Auyama

Broccoli	Melón	Zapote	Tamarindo
Durazno / Melocotón	Berenjena	Apio	Castaño de grano
Castaña	Ajo	Cilantro/Cilantrito	Remolacha
Espinaca	Ají pequeño	Ciruela	Uva
Ají grande	Pepino	Kiwi	Guayaba
Pina	Papaya/ Lechosa	Chinola	Sandia
Toronja	ñame	Coco	Granadillo
~~Guyabana~~	~~Hongos~~	~~Maiz~~	

Guanabana quiere

8. ¿Quisiera consumir más frutas y vegetales? ¿Por qué o por qué no?
   a. Si
   b. No Prefiera
9. ¿Quisiera consumir frutas y vegetales diferentes?
   a. Si Si sí, cuales? _____
   b. No
10. ¿Que se ~~previene~~ impide de consumir más o diferentes frutas o vegetales?
    a. Dinero b. Acceso c. Calidad d. Mantenimiento
    e. No hay interés
11. ¿Cómo obtiene la comida?
    a. Comprarlo de un mercado
    b. Comprarlo del colmado / quesqua
    c. Comprarlo de un amigo o directamente de una granja/finca (o cambiar una cosa tuya por la comida)
    d. Recibirlo de familia o de amigos (gratis)
    e. Crecerlo/sembrarlo por tu mismo en una granja/finca/cerca/conuco o en casa
12. ¿Qué es una comida que compra en el mercado?
13. ¿Cuánta comida se compra su familia y cuánta se crece? (una proporción)
14. ¿Qué siembra/crece durante el año?
15. ¿De la comida que crece, cuanto se vende y cuanto se come en casa?
16. ¿Tiene animales de granja/finca?
    a. Si
    b. No
17. ¿Qué animales tiene? (Opcional: ¿Cuantas de cada uno tiene? ¿Cuántos adultos? Cuántos jóvenes?)

Vacas	Puercas	Gallinas
~~Graznas~~ Ganso	Patos	Perros
Chivos	Otras	

18. ¿Qué les dan los animales? (¿Las vende, come, come los productos o todos?)
19. ¿Cuántas personas ganan dinero en su familia? ¿Qué trabajo tienen?
20. ¿Cuántos niños se cuida en su casa? (si no hay, la entrevista termina aquí)
    a. Menos de 5 años _____

b. 5-10 años _____

c. 11-13 años_____

d. 14 -18 años_____

21. ¿Ud. sabe del programa del verano que enseña Alicen? [Si contesta en el negativo, explique el programa y use el papelito, conteste preguntas]
22. ¿Participan sus niños? ¿Por qué o por qué no?
23. ¿Quisiera que participen los niños? ¿Por qué o por qué no?

Dianes

APPENDIX B

FOOD

The following pages contain pictures of food taken during my time in La Esquina during the summers of 2013 and 2014. My left thumb was the most convenient measure of scale. One thumb is approximately 2cm wide at the knuckle and 2.7cm from knuckle to tip. In pictures where a thumb was a reasonable comparison of scale, my thumb was located within an inch of the object itself.

This appendix is divided into two sections, each organized alphabetically. The first presents photos of food labelled with the local name and my closest English approximation. Some of them also include the scientific name according to the Dominican government's record of cultivars. Most pictures are also accompanied by a short description of the food and its uses. Descriptions of taste are a product of my own observations.

The second section contains pictures of meals I was served in the Dominican Republic. Most of the meals in this section were served to me by my host family. A few photos were taken in restaurants in Santo Domingo, and the meals in them were presented as authentic Dominican food. The descriptions of each meal will contain the location of each photo, a description of the foods it contains, and notes about the time of day the meal was served or would typically be served.

Foods

Ají Pequeña
Little Peppers
Cappsicum annum

Most commonly used as a seasoning, *ají pequeña* is used in small quantities and rarely consumed by itself. The Program Director is wont to use them in everything, as they are one of the few spicy foods in local food.

Aji Grande
Bell Peppers
Genus species

Bell peppers are used to season foods and are sometimes included in a salad. They usually arrive in the grocery trucks.

Batata
Sweet Potato

Far sweeter than potatoes or *castaña*, *batata* is a typical dinner food, and it usually boiled or fried.

Bramberi

This little fruit is weird and there is only one plant that I know of in *La Esquina*. At the time this photo was taken, the fruits were not ripe. It looks like a fuzzy tomato, but it bounces like a rubber ball because it has a rind instead of a skin. When the fruit is ripe, the outside stays green and the inside is red. The juice made from this fruit is bitter (*amargo)* and the rind cannot be eaten. This fruit was only mentioned by one household.

Castaña
Breadfruit
Genus species

The meat of the fruit could be mistaken for potato when mashed, though the flavor is slightly sweeter than the brown potatoes commonly used in the *campo*. The meat of the fruit is commonly served boiled in triangular chunks, though it can be fried after being boiled. The meat itself is patterned with the same scales as the rind of the fruit, a web of white on tan.

Cajuil
Cashew Fruit
Anarcardium occidental

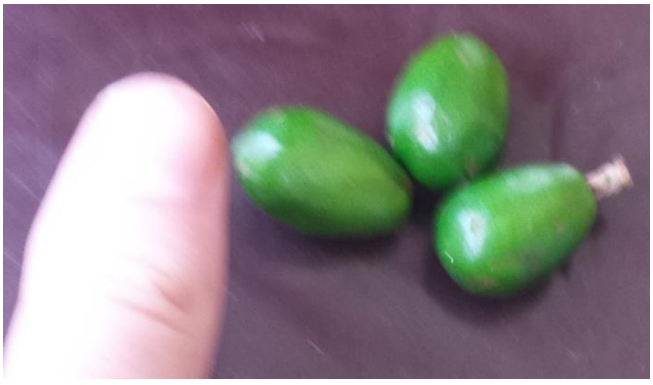
My friends and I discovered these fruits in the Summer of 2013. Cashew fruit come in a variety of shapes and sizes. They are mostly water and taste almost like a pear.

Cereza
Cherry

Cherries in the Dominican Republic, in general, exhibit a greater variety of colors and flavors than the standard dark red to black, sweet, pitted variety seen in the United States. *Cereza* range in color from bright red to an orange that is almost yellow. People will still eat them if they are partially green. Whole cherries contain multiple wrinkled pits that are chewable. *Cereza* are often consumed as a juice because they tend to be sour as well as sweet.

Chinola
Passion fruit
Passifloca odulis

Chinola is usually consumed as a juice, though it is also used in *dulces* (sweets).



Ciruela
Plum

When ripe, these little green plums are twice the size pictured and plum colored, maintaining their ovular shape. Each one of the plums pictured was about the size of a thumb. Scale was not appropriately used in this picture. *Ciruela* is consumed as a juice, but more often as *dulce*.

Dulce de Coco
Coconut Candy

Dulces are homemade candies, often made with coconut, peanuts (*maní*), or fruit. This particular piece I bought from a woman walking through the community with a basin full of it, freshly cooked and still chewy. Made by boiling water, sugar, and other ingredients, *dulces* come out in relatively flat chunks and are sold that way.
Note: manufactured sweets, such as cookies and candy, are also called *dulces*.

Guayaba
Guava
Psidium guejaba

Guayaba are small, greenish-yellow fruits with pink insides and lots of yellow seeds. The seed are edible. The fruit is sweet, but slightly acidic. Most households tend to consume Guayaba in juice, dulce, or raw.

Limoncillo
Spanish Lime

Limoncillo are a favorite for kids, though they are a choking hazard for younger children. They grow on trees and they're often sold in bunches by vendors on the beach. The skin splits easily and the stringy meat of the fruit is sucked off the large pit. *Limoncillo* are usually eaten fresh. Some people do not like the astringent taste or the strange feeling they leave in the mouth.

Lechosa
Papaya
Carica papaya

Papaya trees grow in front yards, along roads, and in orchards. They are not as easy to climb as mango trees because all their branches shoot out from the tops if the trees, at least 10ft in the air. The fruit has a green rind and an orange-yellow filling. It is often used to make juice and *dulce*, or it's eaten raw.

Mango
Mango
Mangifera indca

Mangos are found all over the *campo* and I have only ever seen them informally harvested by roving bands of children directed by teenagers. I have spent several afternoons sitting in a field eating mangos with friends while boys as young as 6 climbed trees or threw rocks to harvest more. Few mangos every made it home. I have been told there are thirteen varieties grown in the area. This picture is of *mango melocotón* (peach mango).

Molondrón
Okra
Hibiscus esculentus

These particular okra are too big to eat. They will be used for seeds. These okra were actually grown at the garden the program director has set up at Faro de Cabrera. Since the Summer of 2014, these okra have produced a second crop at the school, some of which were harvested early enough to be eaten. I've never actually seen okra used in a meal, but people grow it.

Ñame
Dominican Yam
Dioscorea spp

I have never seen ñame in an unprepared form. Ñame is another tuber found on the island that is commonly used in all households, though it has a higher value than yuca. In the picture to the left, ñame is being diced before it is thrown into a pot of *sancocho*, a traditional stew eaten at celebrations.

Yuca
Yuca, Cassava Root
Manihot esculenta

Yuca is a Dominican staple food. It can be ground into flour to make cassava bread, the food of the indigenous inhabitants of Hispaniola, who are now extinct. Most households prefer to eat it boiled or fried. Yuca comes out of the ground as a root with a coarse brown skin. Once it's peeled, it must be cooked in order to be consumed.

Meals

Spaghetti and *Tostones*

Tostones are twice-fried slices of green plantain. They are a common food in both the Dominican Republic and Puerto Rico. Spaghetti is not a normal food, but it isn't special either. Sometimes it just means we're out of rice. Spaghetti is also considered a beach food. I had this for dinner.

Potato Salad, Eggplant, and *Moro*

This was lunch one day. There were visitors, so we had slightly different foods for lunch. Eggplant was reported as a meat substitute by a few of the interview participants. In this picture it has been prepared *rellenos*, battered and fried. This meal also contains potato salad, which has egg, carrot, and potato in it. A red bean *moro* encompasses the rest of the meal.

Mofongo
Fried green plantains are mashed, mixed with meat (usually pork rinds), pressed in to a ball, and fried again.

Mofongo is not an everyday food in the *campo*. This picture was taken at a restaurant, where *mofongo* can be served with a variety of proteins including chicken and shrimp.

Mangu
Fried green plantains mashed and mixed with onions and butter

Mangu is another of the many plantain dishes made in the Dominican Republic.

Ensalda Mixta
Tayota, hard boiled eggs, fried ripe bananas, and carrots

This dish is commonly referred to as *ensalada*, which is the Spanish word for "salad". This is typical all over the Dominican Republic. It makes ordering a salad at a restaurant very interesting because servers often get confused as to which *ensalada* people want.

Castaña, Eggs, *Moro*, and Chicken

This dinner was pretty extravagant compared to most of my dinners. My host mom was given *castaña* (one of my favorite foods) by a friend, we had plenty of leftover *moro* from lunch, but not very much chicken. Eggs helped make up the protein deficiency.

La Bandera Dominicana
Rice, Beans, and Meat (Chicken)

This was my lunch almost every day. Sometimes I would get a side of vegetables. Sometimes there'd be beef or pork instead of chicken. The most common meal modification was to substitute black beans for red beans.

Locrio and Chicken

Locrio is a mix of rice and other foods. Sometimes *locrio* is made with meat, sometimes with vegetables, sometimes both. It depends on what is available. It's a lot like fried rice. For some households, *locrio* is a special lunch.

Tostones, Cheese, and *Salami*

This is a normal dinner for me. Sometimes cheese is excluded, because it is expensive and the community members do not always have any available to sell. The cheese made in the *campo* is a mozzarella called *queso de hoja*. It's a very squeaky cheese with a rubbery consistency. *Salami* is actually more like bologna, and it's usually pan fried until the edges are crisp.

APPENDIX C

THE COLMADO & THE GUAGUA

The *colmado* and the *guagua* are the two most important sources of food in the communities of La Esquina, El Callejón, and El Pujador. To avoid unnecessary lists in the body of the thesis to which this document is appended, I have chosen to put pictures and descriptions of each of these sources here.

The Colmado

The word "*colmado"* is used to describe the small general stores that provide the essentials to rural and urban areas. The following are pictures of the *colmado* in La Esquina.

The store is attached to the home of the family that runs it. The store itself is only about a quarter of their home and all members of the family contribute to its operation. Inside, the *colmado* a counter and a system of shelves store and organize the wide variety of goods sold.

I also wrote out an inventory of the *colmado* based on the pictures I took that day. Not all of the pictures are depicted in this appendix. The inventory is below.

Col mado Audelina

- Botellón de agua
- Homemade dulce de coco y de maní
- biscuit bread things
- bread
- eggs
- 5L water containers
- Oreos - reg & golden
- Ritz crackers
- club social
- trident
- closets
- Halls
- 25 lbs bags of rice
- Kola Real - 2L, 1L
- garlic
- onions
- vinagre
- potatos
- spaghetti
- rum
- soda - grape, orange, apple
- orange juice
- malta india
- bottled water
- Salami
- box milk
- laundry detergent
- bleach
- salt
- canned sardines
- soup mixes
- powdered milk
- canned corn
- canned peas
- canned beans
- formula mix
- Maggi
- vegetable oil
- oatmeal mix
- canned mixed veg.
- gatorade
- hot sauce
- condensed milk
- toys
- candles
- toothpaste
- diapers
- deodorant
- sanitary napkins
- Pasta
- razors
- motor oil
- drink mixes
- rice by the scoop
- juice boxes

The Guagua

The word "*guagua*" is used to refer to any vehicle that cannot easily be classified as a sedan (*carro),* a large truck (*camion, camioneta*), or a bus (*autobus*). Pick-up trucks, mini-vans, SUVs, and the fifteen to thirty passenger vehicles used for public transportation all fall under the *guagua* category. The *guaguas* used for the mobile groceries that visit the communities are small, half-ton pick-up trucks, from US auto manufacturers like Chevy and Ford. There are usually two workers in the *guaguas*, one to drive and one to announce items and prices through the speaker system. When someone wants to buy from one of the *guaguas* the catch the attention of the driver as the *guagua* passes by. The driver stops, and they do business. All the *guaguas* that sell food carry scales, because most produce are sold by weight.


RAPURNO
-CASC